EXECUTIVE

MODELS 750-H & 750-HB

OPERATION and MAINTENANCE MANUAL

International
CRYSTAL MFG. CO., Inc.
OKLAHOMA CITY, OKLAHOMA

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Issued 3/18/64
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EXECUTIVE

MODELS 750-H & 750-HB

OPERATION and MAINTENANCE MANUAL

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INTERNATIONAL
Crystal Mfg. Co., Inc.
18 N. Lee
Oklahoma City, Oklahoma

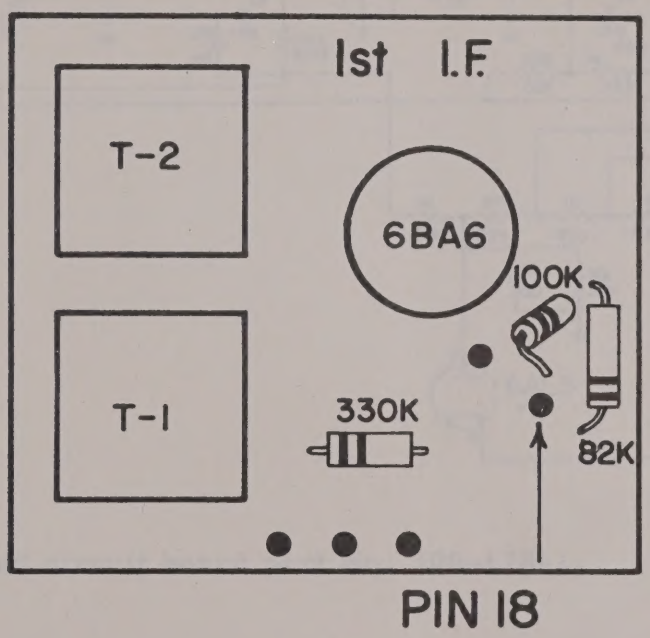
ADDENDUM #1
Issued 8/7/64

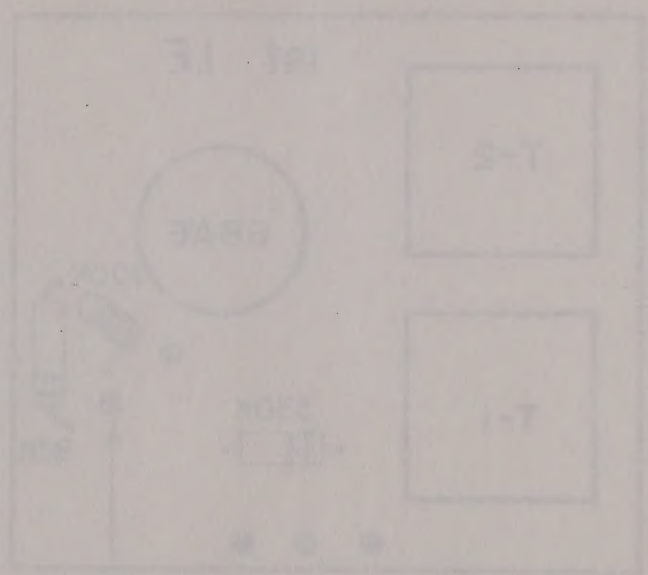
MODEL 750-H & 750-HB

When the RMO-24HB is to be used with a Model 750-H TRUNK unit, the following addition must be made to the trunk unit.

Furnished with the RMO-24-HB you will find a blue terminal connected to a piece of blue wire with a printed circuit board power pin connector fastened to the other end of the wire.

Slip the power pin connector end of the wire through the opening in the trunk unit front panel marked PL-10. Snap the blue terminal bushing in place in the front panel and connect the other end of the blue wire to power pin #18 on the 1st IF board.

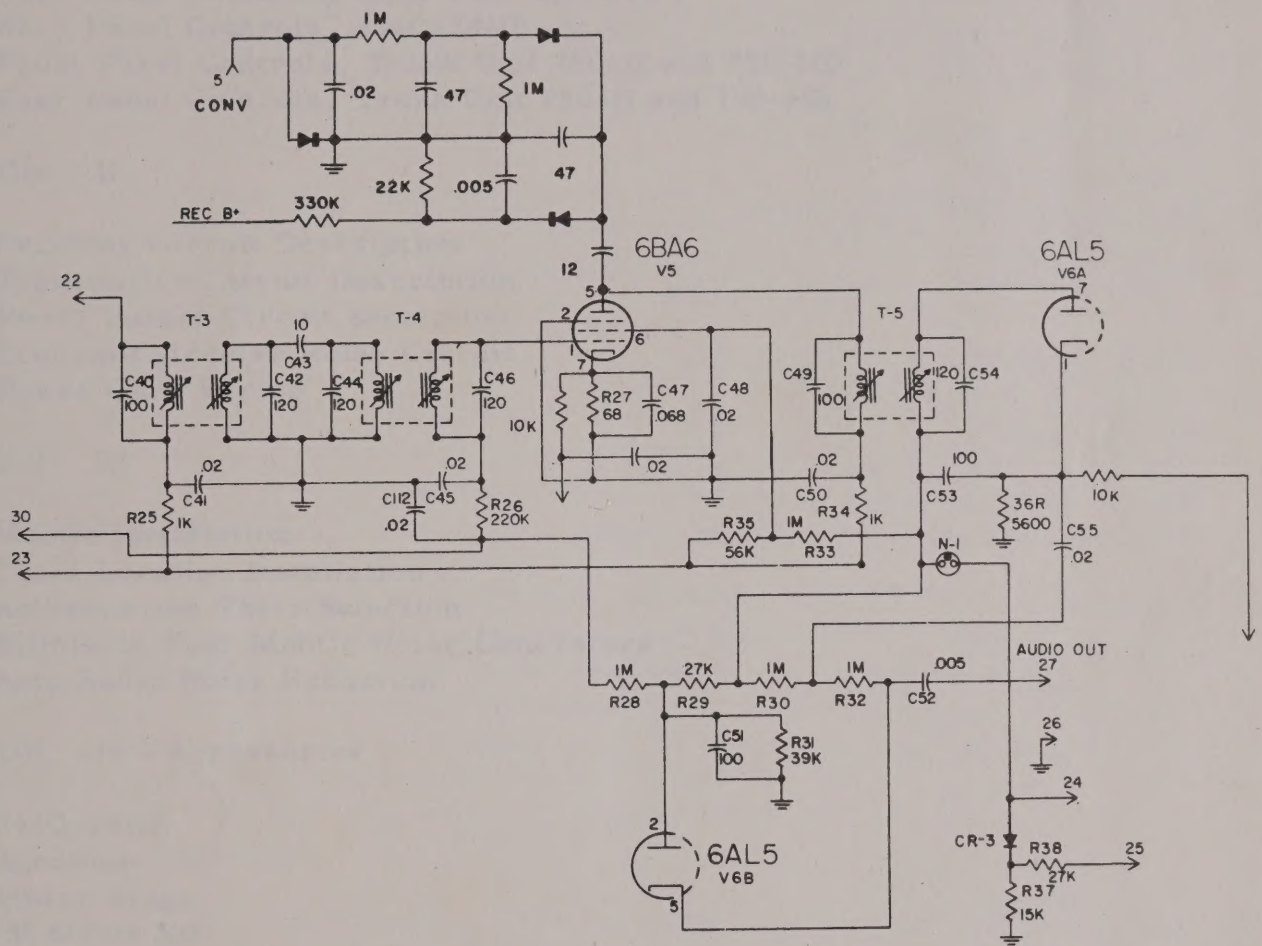




ADDENDUM #2
Issued 8/18/64

MODEL 750-H & 750-HB

Beginning with units bearing serial Nos. YF-20000 and XF-14000 respectively the last IF board part #300-178 has been changed as shown below.



New printed circuit board part No. 300-178-1.

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SECTION I

GENERAL

The INTERNATIONAL EXECUTIVE, Models 750-H and 750-HB are the latest of the Executive series designed for remote control operation. This Citizens Band unit combines a sensitive and selective dual conversion receiver with a highly stable and efficient crystal controlled transmitter. The transmit and receive frequency selector circuits are housed in the RMO unit.

A frequency synthesizer is provided in the RMO unit for the selection of any one of the 23 citizen band channels. A squelch circuit is built-in to provide receiver quieting during periods when no signal is being received. The crystals supplied have a frequency tolerance of .005% when used in the EXECUTIVE.

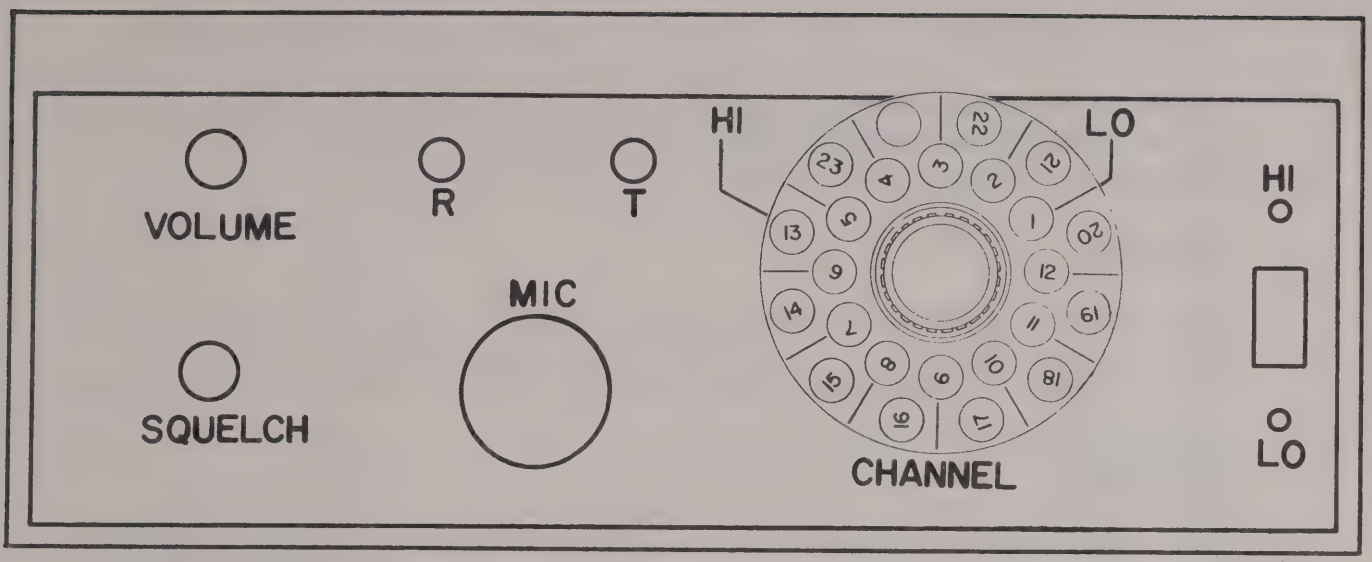
The illuminated 12 position CHANNEL selector dial allows the operator to instantly select the desired channel in two ranges. With the HI-LO switch in the LO position, channels 1 through 12 are selected by the CHANNEL selector dial and when placed in the HI position, channels 13 through 23 are selected by the CHANNEL selector dial.

The EXECUTIVE has been designed with flexibility of installation in mind. The Executive models 750-H and 750-HB are identical as far as circuitry is concerned. The model 750-H with its smaller remote control unit and separate speaker case is designed primarily for mobile installation whereas the 750-HB with the larger remote control unit, enclosed speaker and "S" Meter is designed for base station operation. Both units will operate from 6 or 12 VDC and 115 VAC. They may be used with a base loaded whip antenna, regular whip, ground plane, beam and other types of antennas.

Though the unit is very versatile, it is not to be expected that either receiving or transmitting results will be the same in every installation. As in all radio communications and particularly in VHF application, the type of antenna, its location above ground, the noise present in the area and other factors are bound to affect the results obtained.

SPECIFICATIONS

Receiver:	
Tuning Range	Crystal Controlled-any channel, 1 through 23
Sensitivity	Usable to .5 microvolts
Selectivity	50 db down at 10 kc 60 db down at 20 kc
Image Rejection	Better than 50 db down
Audio Output	2.5 watts into 4-6 ohms
Speaker Impedance	4-6 ohms
Squelch range	.5 to 20,000 microvolts. On-Off differential is approximately 1 microvolt, at 5 microvolt input
Noise Limiter	Automatic, series-gate
Transmitter:	
Tuning Range	Crystal Controlled any Channel, 1 through 23
Frequency Stability	± .005% @ 0° to 125° F, when used with INTERNATIONAL high stability crystals
RF Power input	5 watts maximum (FCC rules)
Modulation	Capability-100%
Power Consumption:	
Transmitting	65 watts (approximately)
Receiving	60 watts (approximately)
Microphone:	High impedance, ceramic or dynamic type with (push-to-talk switch)



RMO 24-H FRONT PANEL

RMO 24-HB FRONT PANEL

RMO-24-H CONTROLS

ON-OFF SWITCH

The on-off switch on the VOLUME control completes or breaks the primary 110VAC or 6 or 12 VDC circuit to the power supply and is fused in the RMO Unit.

VOLUME

The function of this control is to set the audio level in the speaker. With the unit turned on, the AUDIO LEVEL control on the transmitter/receiver is set then the RMO control is used in the normal manner.

SQUELCH

The RMO Squelch Control is used to eliminate background noise when no signal is being received. Upon intitial warmup, turn this control fully counterclockwise until a click is heard. The switch in the squelch control is OFF in this position. To operate, turn squelch control on and fully clockwise. Then slowly turn the control counter-clockwise until the background noise just disapears. Leave the control set at this point. Do not turn the control too far counter-clockwise as this will reduce the receiver performance and weak signals will not be heard.

CHANNEL SELECTOR

The RMO contains an illuminated 12 position channel selector. When used in conjunction with the HI-LO switch this control switches transmit and receive crystals simultaneously to any one of the 23 citizen band channels.

CAUTION: With the HI-LO switch in the HI position DO NOT operate the transceiver with the CHANNEL selector dial on the blank button between channels 22 and 23.

HI-LO SWITCH

This control located to the right of the Channel Selector dial selects the transceiver operating frequency range. With the switch in the LO position channels 1 through 12 are selected by the CHANNEL selector. When placed in the HI position channels 13 through 23 are selected by the CHANNEL selector dial. Pilot lamps are automatically switched to illuminate the proper channel indicating button.

CAUTION: With the switch in the HI position DO NOT operate the transceiver with the CHANNEL selector dial set on the blank button between channels 22 and 23. This will result in operation on an unauthorized frequency.

MICROPHONE (Recepticle)

The RMO Microphone connector requires a four-prong lock-on plug which is furnished with the unit as a part of the microphone. High impedance crystal or ceramic and dynamic microphones may be used with this transceiver.

INDICATOR LAMPS

RECEIVE INDICATOR

This indicator identified by the letter "R", functions as an on-off (plate voltage) indicator for the receiver section of the transceiver. When the transceiver is operating in Receive position the lamp will glow steadily and go out when the transceiver is placed in the Transmit position.

TRANSMIT INDICATOR

This indicator identified by the letter "T", functions as an on-off (plate voltage) indicator for the transmitter section of the transceiver. When the transceiver is operating in Transmit position the lamp will glow steadily and go out when the microphone button is released and the transceiver returns to receive position.

RMO-24H BACK PANEL

FUSE

A 15 ampere fuse is installed in the fuse holder and may be changed or replaced if necessary by unscrewing the red insert in the center of the holder. If the transceiver is to be operated on 12 volts dc the fuse should be replaced with one having a rating of 7.5 amperes.

PL-4

This 15 contact connector mates with the 15 contact female cable connector for interwiring between the RMO console and the trunk unit.

SO-3

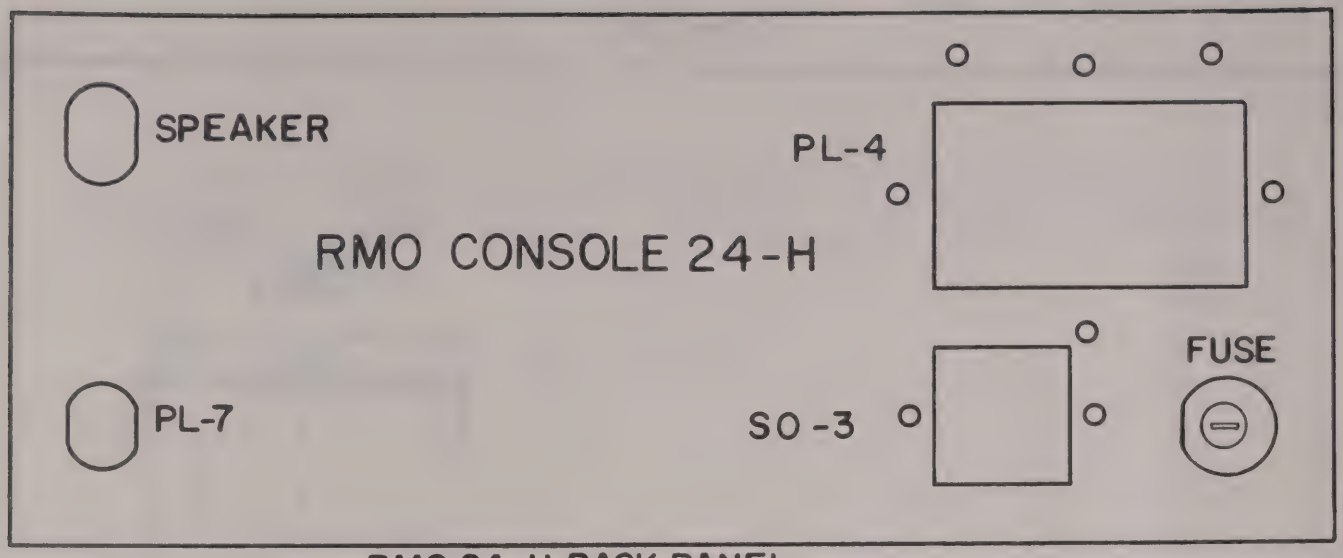
This 4 contact connector mates with a 4 contact jumper plug. This plug may be wired for 115 VAC operation or 6 and 12 volt DC operation. See wiring instructions in cord kit.

SPEAKER

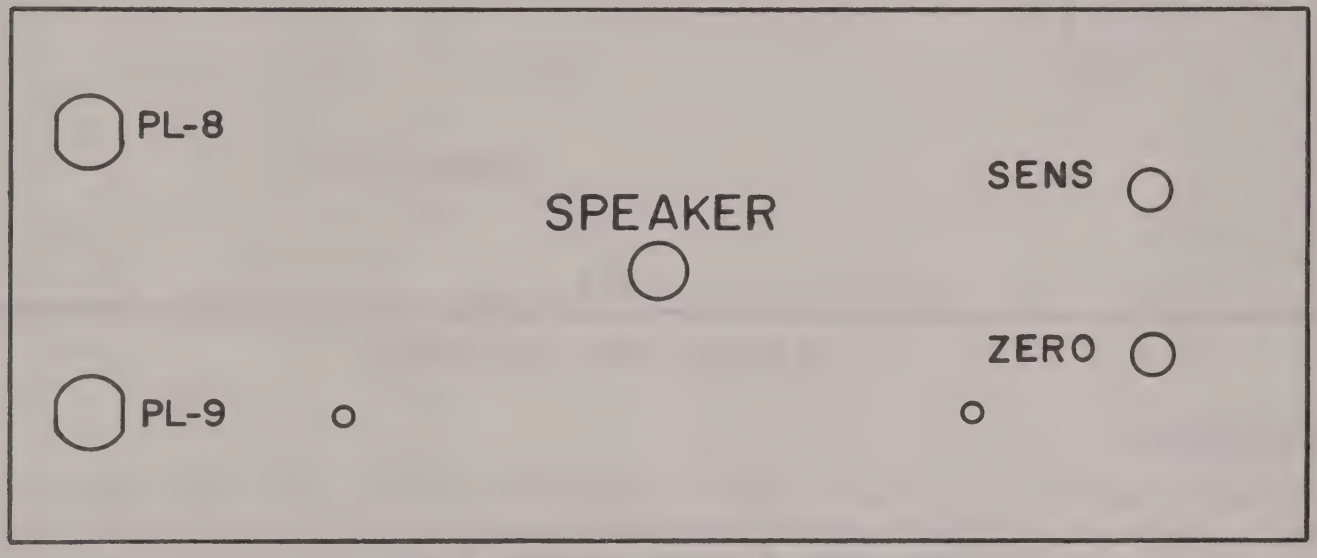
This two contact connector (Green) is used for connection between the RMO console and speaker unit with connectors attached to end of the speaker unit wires.

RMO-24HB BACK PANEL

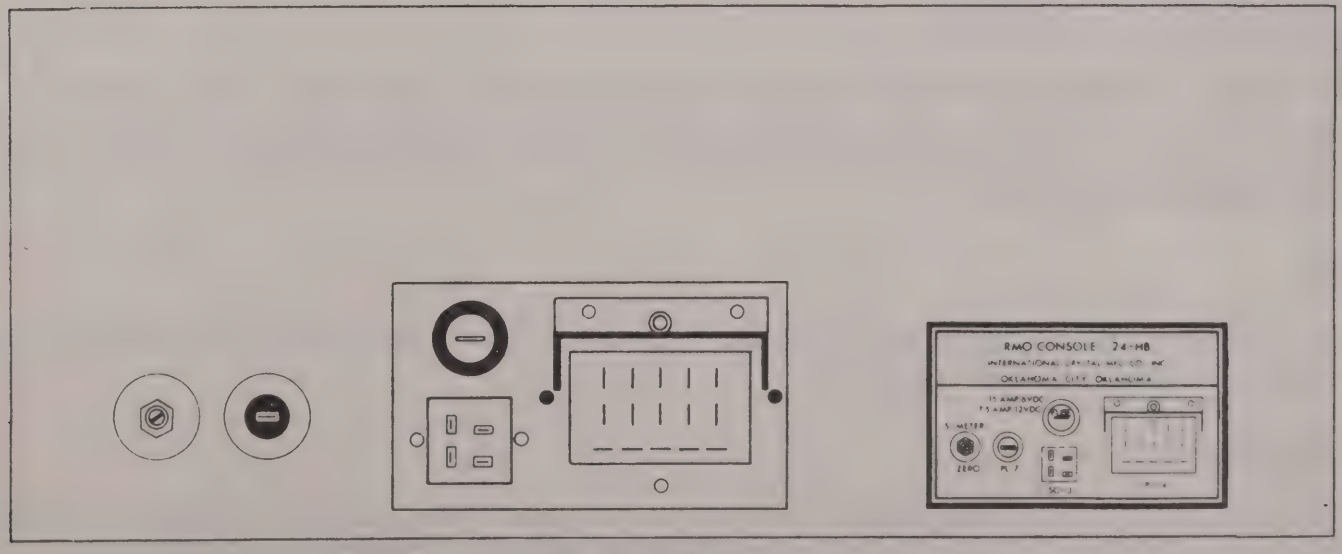
The connections made to the back panel of the 750-HB are the same as the 750-H except there is no speaker connection since the speaker is mounted internally in this unit. The 'S' meter is included in the unit. An additional connector is provided for interwiring the 'S' meter with the main unit. The 'S' meter zero control is also mounted on the back panel next to the single contact (blue) connector.



RMO 24-H BACK PANEL



RMO 24-H SPEAKER BACK PANEL



RMO 24-HB BACK PANEL

TRUNK UNIT

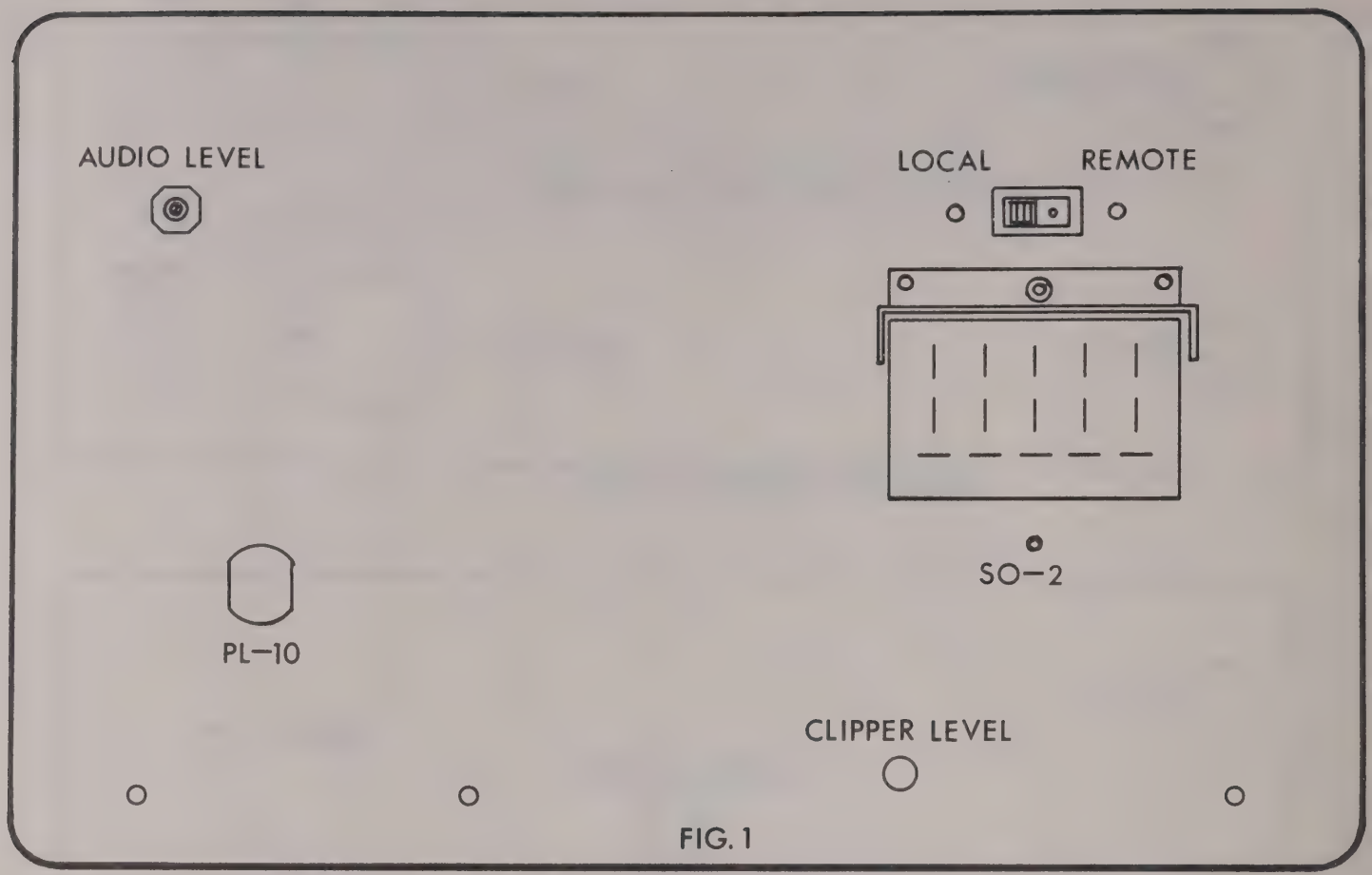


FIG. 1

FRONT PANEL CONTROLS

AUDIO LEVEL

This control sets the overall gain of the receiver audio section. With the antenna connected to the transceiver and squelch control completely off set the RMO speaker 1/2 open. Then set the AUDIO LEVEL control for normal listening level. The speaker volume may then be controlled by the speaker volume control on the RMO.

LOCAL-REMOTE SWITCH

The LOCAL-REMOTE switch is placed in the REMOTE position when the transceiver is shipped from the factory. This control allows the operator to switch the transmitter ON from the trunk compartment for final tune-up. After tune-up this control must be returne to the REMOTE position.

SO-2

This 15 contact connector mates with the 15 contact male cable connector for interwiring between the RMO and the trunk unit.

CLIPPER LEVEL

This control is used in conjunction with the microphone gain control to allow the operator to maintain a higher average level of modulation without exceeding the 100% limit. Both controls have been pre-set at the factory for a normal voice level when speaking about three inches from the microphone.

PL-10

This connector is supplied on the Model 750-HB unit only. It's function is to interconnect the 'S' meter in the RMO unit. This connector is supplied for installation in the Model 750-H in the 'S' meter kit #150-263.

TRUNK UNIT

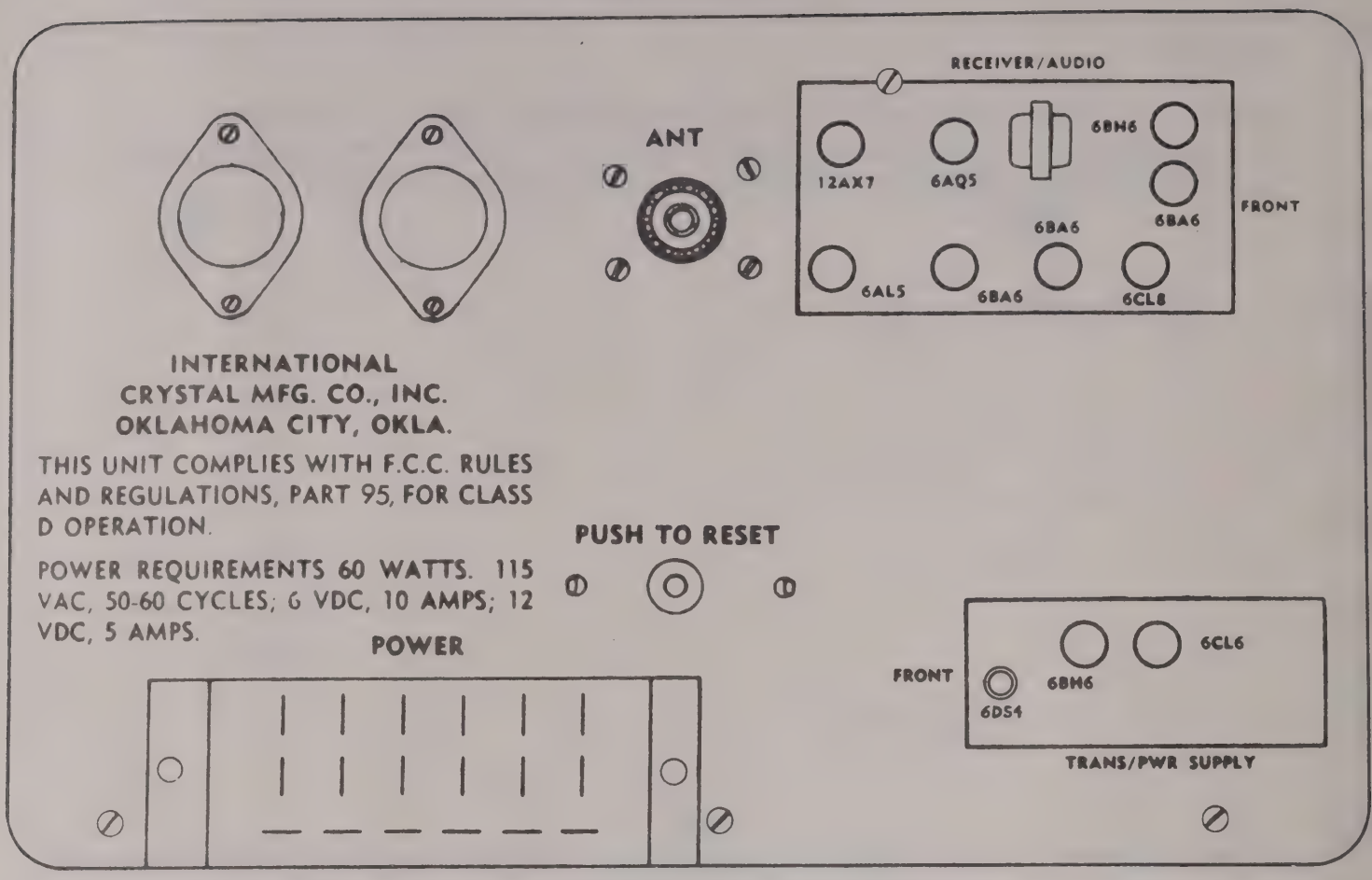


FIG. 2

REAR PANEL CONTROLS

ANT (Antenna Receptacle)

This receptacle is used to connect the transceiver line to the transmit-receive relay, TR-1. The receptacle is a standard low-loss, VHF type designed for 50-75 ohm coaxial cable.

PUSH TO RESET

This is a thermal cut-out. It protects the unit when it is being operated on 115 volts ac. If overload causes it to cut out, it can be reset by pressing in on the plunger and holding it in for about two seconds.

POWER

An 18-contact plug is used as a power connector. This allows various input voltages to be used without requiring changes within the unit. All necessary connection changes are made on the external plug. Five different cord assemblies are used; 115VAC, 6VDC negative ground, 6VDC positive ground, 12VDC negative ground, and 12VDC positive ground

SECTION II

RECEIVER CIRCUIT DESCRIPTION

The receiver section of this transceiver is a double conversion unit employing the superheterodyne principle of frequency conversion. The first conversion is composed of three basic sections; an RF amplifier, mixer, and oscillator which is crystal controlled. The crystal controlled oscillator is housed in the RMO console.

A received signal from the antenna is coupled to the control grid of the RF amplifier through a double tuned circuit consisting of coils L1 and L2, their respective shunting capacitors, and coupling capacitor C3. This double tuned circuit aids greatly in the elimination of unwanted signals outside the passband to which it has been tuned. The gain of the RF amplifier is controlled automatically by the receiver's AVC system coupled to the control grid of V1 through a 1 megohm resistor.

After reaching the control grid of V1 (6BA6) the signal is amplified and coupled to the control grid of the mixer, V2. Here the signal is heterodyned with a signal in the 17mc region coupled through the cable from the crystal controlled oscillator in the RMO unit. A difference frequency signal of 10,000kc or 10150kc is selected by coil L6 in the plate circuit of the mixer, V2 and coupled to the grid of the second mixer in the IF strip. The first IF signal frequency is dependent upon the position of the HI-LO switch in the RMO. In the LO position channels 1 through 12 are received and the resulting IF frequency is 10000kc. In the HI position channals 13 through 23 are received and the resulting IF frequency is 10150kc.

The second section of the receiver consists of a mixer and crystal controlled oscillator, two 455kc intermediate frequency amplifiers, a second detector and noise limiter, and a special squelch circuit. Additional selectivity is obtained by the use of two lightly coupled transfomers between the mixer and 1st IF amplifier stage and also between the 1st and 2nd IF amplier stages.

The 1st IF signal received at the grid of the second mixer, V3A, is heterodyned with a 10455kc or 10605kc signal from the crystal controlled oscillator, V3B. The difference frequency of 455kc is selected in the plate circuit of V3A and coupled to the control grid of the intermediate frequency amplifier, V4. The gain of this amplifier is also automatically controlled by the AVC system connected to the grid of V4 through the secondary of transformer T2 and a 220K ohm resistor. The signal is further amplified in V4 and coupled to the grid of V5 through transformers T3 and T4. AVC voltage is also applied to this stage through the secondary of transformer T4 and a 220K ohm resistor.

The signal is further amplified in V5 and coupled from the plate through transformer T5 to the plate of the detector, V6A, where the audio component is detected. V6A is also used to produce the AVC voltage. The detected signal is coupled to V6B which acts as a series-type noise limiter removing noise pulses which may ride through on the signal. The squelch circuit consisting of a neon lamp, N-1, silicon diode, CR-3 and associated components is connected so that the audio section of the receiver is cut off and background noise eliminated when no signal is being recieved. The cut-off level may be varied by use of the squelch control.

The third section of the receiver is a conventional audio amplifier consisting of a twin triode audio voltage amplifier, 12AX7, V7A-V7B followed by a 6AQ5, V9 tetrode power amplifier. When the transceiver is in RECEIVE position only one-half of the 12AX7 is used. The second triode section, V7B, receives the audio signal from the center tap of the volume control. The audio signal is amplified in V7B whose output is RC coupled to the control grid of the power amplifier, V9, through a bandpass circuit consisting of choke L10 and capacitors C64 & C65. The audio signal is further amplified in V9. The plate of V9 is connected to transformer T-6, which performs a dual function. In RECEIVE position this transformer acts as a normal output transformer with its secondary connected to the speaker. In TRANSMIT position, its function is that of a modulation transformer.

In TRANSMIT position, V7A is utilized as a straight voltage amplifier. This stage is preceeded by a level clipping circuit consisting of a 6DS4, V8, diodes CR-4 and CR-5 and associated components. This clipping circuit allows a higher average level of modulation without the danger of exceeding the 100% limit.

TRANSMITTER CIRCUIT DESCRIPTION

The transmitter is a multi-stage unit consisting of a crystal controlled frequency synthesizer signal generator located in the RMO console, a buffer amplifier and neutralized tetrode final amplifier.

The frequency synthesizer has 12 channel crystals in the 17 mc range which are selected by the CHANNEL selector switch and two heterodyning crystals in the 10 mc range selected by the HI-LO switch. With the HI-LO switch in the LO position a 10 mc crystal is placed in the grid circuit of the triode section (V12A) of V12. This signal is cathode coupled to the pentode section (V12B) of V12. A 16.965 mc to 17.105 mc (channels 1 through 12) signal is coupled from the plate of V13 to the control grid of the pentode section of V12B. The resulting sum frequencies of 26.965 mc to 27.105 mc (channels 1 through 12) are selected in the plate circuit of V12B by L17.

The same procedure is followed for channels 13 through 23 except the HI-LO switch is placed in the HI position and a 10.150 mc crystal is switched into the grid circuit of V12A. This signal is heterodyned as before with the 16.965 mc to 17.105 mc signals from V13 and the resulting sum frequencies of 27.115 mc to 27.255 mc (channel 13 through 23) are selected in the plate circuit of V12B by L17. The output of V12B is inductively coupled through the cable to the grid of buffer amplifier V10. The output of buffer amplifier V10 is also inductively coupled to the grid coil of final amplifier V11. The plate circuit of V11 is a shunt fed pi-matching network. Neutralization is accomplished by capacitor C86, and link coil L13 coupled to the cold end of coil L12.

POWER SUPPLY CIRCUIT DESCRIPTION

A three-way power supply is used in this transceiver. It operates as a conventional, full-wave rectifier circuit on all voltage inputs followed by a capacitor input RC filter network. On 6 or 12 volt battery operation, a transistor oscillator circuit is used to provide the necessary AC voltage for the primary circuit of the power transformer.

The transceiver is supplied with a power cord kit. The unit may be operated either from 115 VAC, 6 volt negative ground, 6 volt positive ground, 12 volt positive ground, or 12 volt negative ground by use of the proper power cord connections. The power supply is equipped with a thermal circuit breaker for protection on AC operation. For protection on 12 volt DC operation a 7.5 ampere fuse is used with the transceiver. Protection on 6 volt DC operation is provided by a 15 ampere fuse which is supplied with the unit. When 12 volt DC operation is desired the 7.5 ampere fuse must be substituted for the 15 ampere fuse.

TRANSMIT-RECEIVE RELAY CIRCUIT DESCRIPTION

By including a transmit-receive relay (TR-1) in this transceiver, the many advantages of "Push-to-talk" operation and maximum transfer of energy to and from the antenna are afforded the operator at no extra cost. The circuit consists of a half-wave rectifier which receives its AC voltage from a 12 volt secondary winding on the power transformer. The rectifier is followed by an RC filter network whose output is connected in series with one end of the relay coil. The other end of the relay coil is connected through the microphone socket to the microphone switch button. This completes the 12 volt DC relay circuit to ground and the relay performs the following switching functions:

RECEIVE- In this position the relay is not energized and the antenna is connected to the receiver input, B+ voltages are furnished to the receiver section and one side of the speaker is grounded.

TRANSMIT- The relay is energized and the antenna is switched to the transmitter output circuit, B+ voltages are furnished to the screen and plate circuits of V7A, V8, V9, V12, V10 and final amplifier V11. The speaker voice coil is removed from ground.

WIRING POWER PLUG FOR MODELS 750-H AND 750-HB

The 3-way power supply may be operated from any one of 5 different power systems; 115 VAC, 6 VDC positive ground, 6 VDC negative ground, 12 VDC positive ground, 12 VDC negative ground. Depending upon voltage to be used, connect the jumper wires to the plug as indicated below.

Remove the cover from the power plug by removing the two retainer pins and then separating cover and base. The sketches below are of the connection side of the plug base. Use the #18 buss wire supplied to make jumpers. Where jumpers cross and there is danger of a short, use a length of the insulating sleeving over the wire.

PART #150-174

115 VAC

115 VAC to pins 1 and 4
Jumper pins 2 and 3
Jumper pins 13 and 18

6 VDC Neg. Gnd.

/ 6 VDC to RMO
-6 VDC Gnd. to pin 1
Jumper pins 1 to 11 to 12 to 14 to 15 to 18
Jumper pins 2 to 5 to 17
Jumper pins 7 to 8
Jumper pins 6 to 9
Jumper pins 10 to 16

6 VDC Pos. Gnd.

-6 VDC to RMO
/ 6 VDC Gnd. to pin 1
Jumper pins 1 to 9 to 12 to 15 to 18
Jumper pins 6 to 11 to 14
Jumper pins 2 to 5 to 17
Jumper pins 7 to 8
Jumper pins 10 to 16

12 VDC Neg. Gnd.

/ 12 VDC to RMO
-12 VDC Gnd. to pin 1
Jumper pins 1 to 10 to 14 to 15
Jumper pins 7 to 8 to 16
Jumper pins 2 to 5 to 18
Jumper pins 6 to 9

12 VDC Pos. Gnd.

-12 VDC to RMO
/ 12 VDC Gnd. to pin 1
Jumper pins 6 to 10 to 14
Jumper pins 7 to 8 to 16
Jumper pins 2 to 5 to 18
Jumper pins 1 to 9 to 15

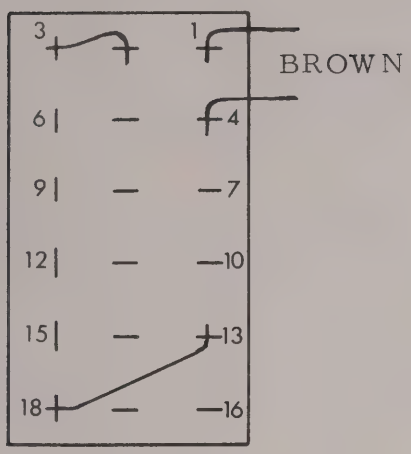
NOTE: Battery voltage connects to the RMO console unit, the black #12 wire from the transceiver plug connects to ground.

JUMPER PLUG WIRING

To facilitate ease of switching between AC and DC operation, a four contact jumper plug is provided. This plug may be wired for 115 VAC operation or 6 and 12 VDC operation as described below.

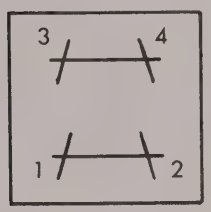
POWER PLUG WIRING
(Models 750-H & 750-HB)
(All views from back of plug)

115 VAC
150-174



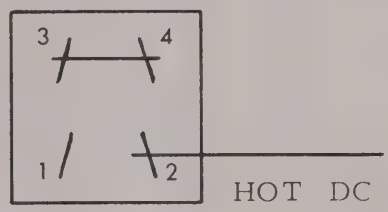
JUMPER PLUGS

115 VAC



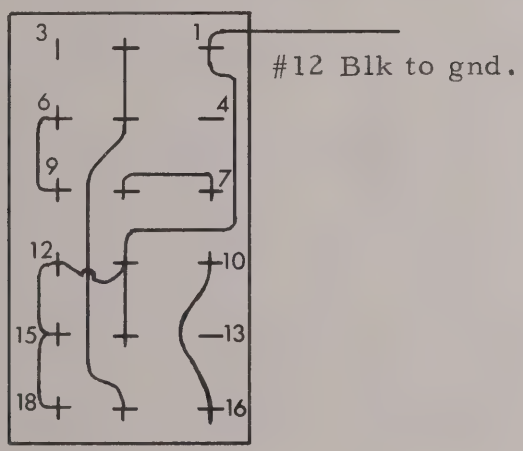
150-267

6-12 VDC

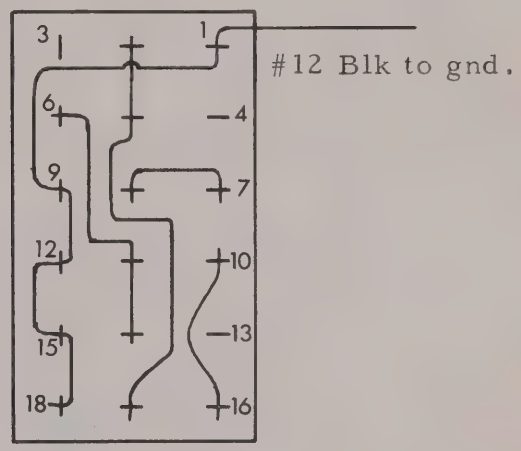


150-268

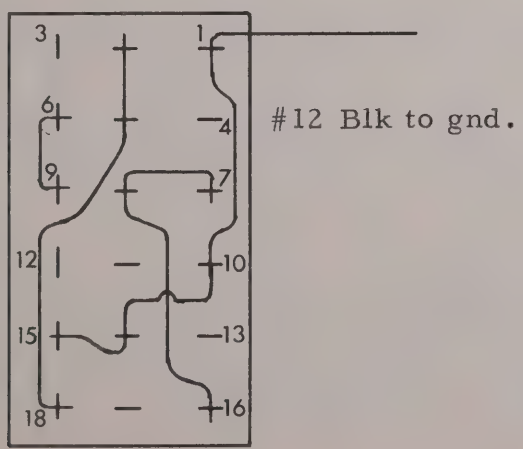
6 VDC Neg. Gnd.
150-259



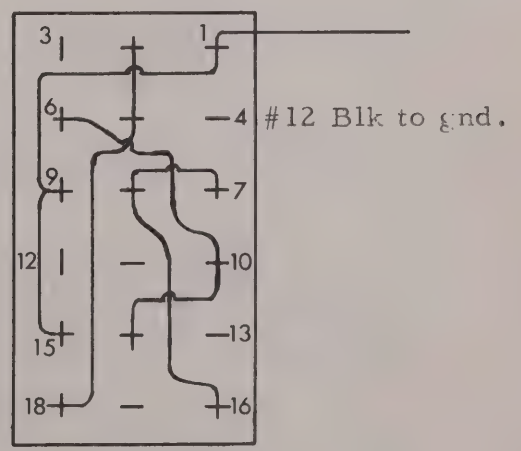
6 VDC Pos. Gnd.
150-260

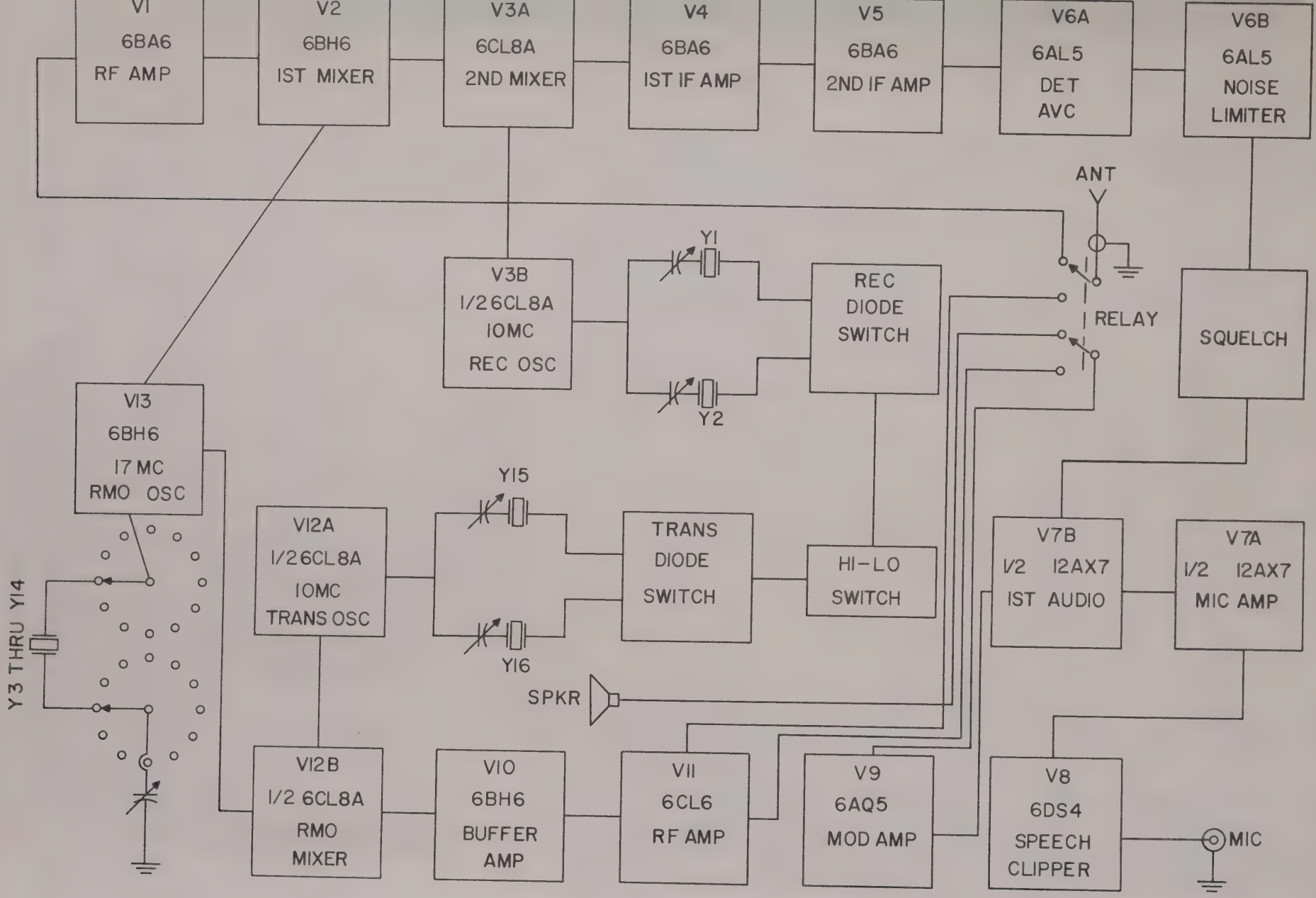


12 VDC Neg. Gnd.
150-261



12 VDC Pos. Gnd.
150-262





EXECUTIVE MODEL 750-H & 750-HB

BLOCK DIAGRAM

SECTION III

INSTALLATION
RMO 24-H

If the RMO unit is to be used in a mobile installation, fasten the RMO cover to the Mobile Mount as shown in Pictorial #1, then fasten to the bottom section of the dashboard in the vehicle.

The speaker case may be mounted separately with its own mobile mount in the same manner as the RMO or it may be mounted on the bottom of the RMO case. The four rubber feet on the bottom of the RMO case seat in the four holes in the top of the speaker case. The two cases are secured together on the sides with the small aluminum plates packed with the case mobile mounts. The plates are secured in place with the RMO case and Speaker case sheet metal screws.

If the unit is to be used in a base station installation, the RMO and Speaker case are fastened together as described above then the two rubber feet at the front on the bottom of the speaker case may be unscrewed about 3/8" to 1/2" to provide additional clearance for the bottom speaker grill.

The transceiver is usually placed in the trunk compartment of the vehicle.

After the units are mounted it will be necessary to connect the antenna transmission line to the antenna connector on the transceiver.

For 115 VAC operation wire the 18 contact power cable for 115 VAC operation. Interconnect the RMO unit and the transceiver with the multi-conductor cable having a 15 contact connector on each end. One end of this cable connects to SO-2 on the front of the trunk unit and the other end to PL-4 on the back panel of the RMO unit. Wire the jumper plug for 115 VAC operation and insert in socket SO-3 on the RMO back panel. Connect wires from speaker case into green speaker terminals on RMO back panel.

For use on 6 or 12 volt D.C. the 18 contact power cable is wired for the desired operation and jumper plug wired for D.C. operation.

The 18 contact power plug is connected to the connector on the back of the trunk unit and the #12 black wire from this plug is connected to ground.

The jumper plug is inserted in socket SO-3 on RMO back panel. The #14 black wire from the jumper plug is connected to hot D.C. and the units interconnected as previously described.

Due to the size of the power cable, the easiest way to route this cable from the front seat area to the trunk compartment is from the RMO unit to the firewall, down the firewall to the left side of the drive line hump under the floor mat along the edge next to door sill and into the trunk compartment.

RMO 24-HB

The Executive Model 750-HB is designed primarily for base station operation on 115VAC. The interconnection between the RMO and main unit is accomplished in the same manner as the Model 750-H except as follows:

1. No interconnection between the RMO and speaker is necessary as the speaker is contained in the RMO console.

2. Connection between the blue connector on the back of the RMO and PL-10 on the main unit must be made for proper operation of the 'S' meter circuit. An interconnecting wire extends from the cable for this purpose.

The Executive Model 750-HB may also be operated from either 6 or 12VDC in the same manner as the Model 750-H.

PACKING SLIP CTZ - 750-H

This package contains one each of the items listed below. If there is any complaint or shortage, this slip MUST BE RETURNED before any adjustment can be made.

1-Model 750-H with Mobile Mount attached

1-Microphone

1-Power Cord Kit

1-Manual

1-Microphone Hanger Bracket with mounting screws

1-7 1/2 Amp Fuse

1-RMO Unit

1-17 Ft. Cable

1-External Speaker Assembly with leads

1-Mobile Mounting Rack, RMO Console and Speaker Assembly

6637 = 1

Code

PACK. 4

Packed By

INSP 4

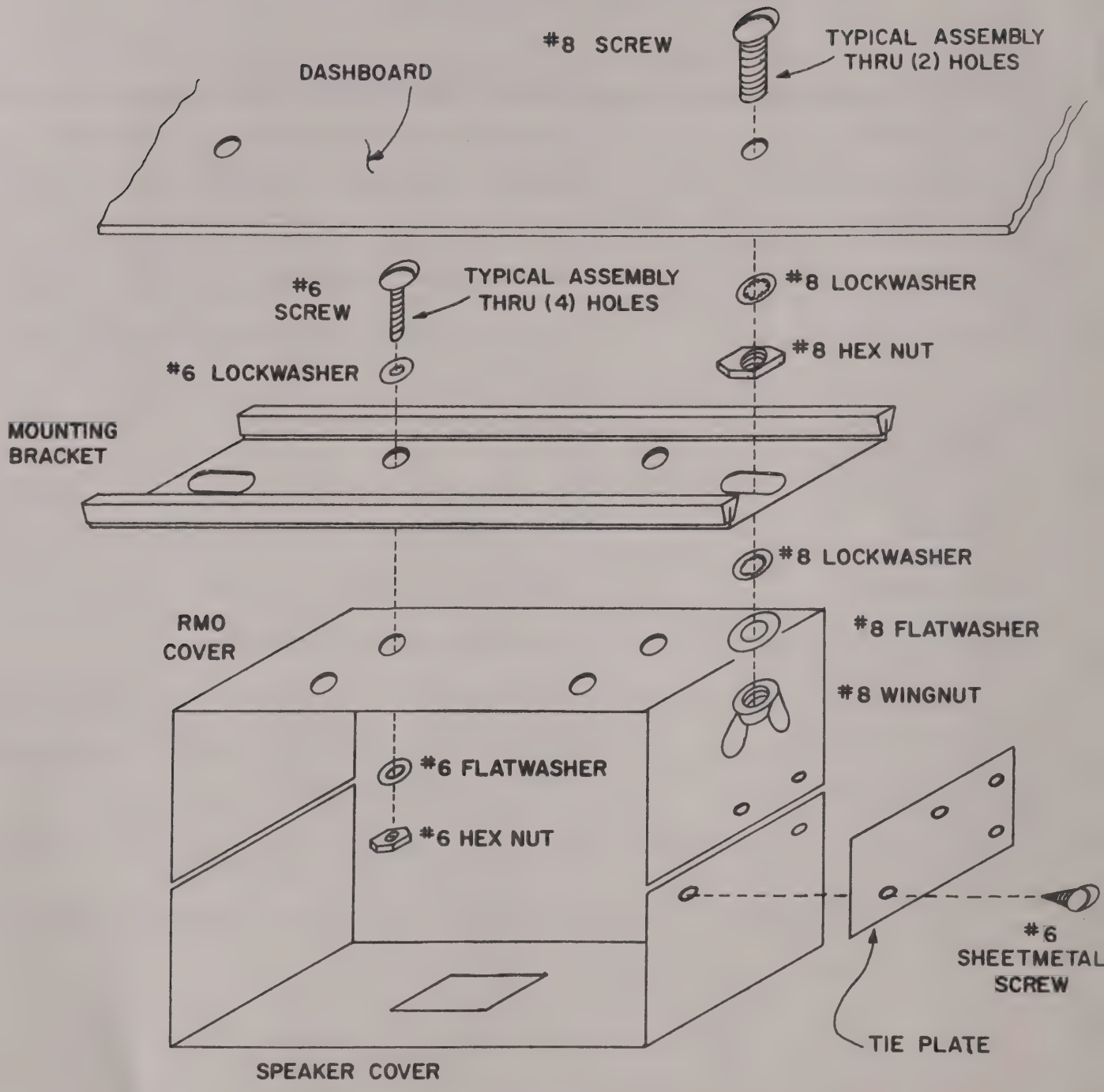
Inspected By

INTERNATIONAL CRYSTAL MFG. CO., INC.
18 NORTH LEE
OKLAHOMA CITY, OKLAHOMA

After the unit is installed and all interconnections are made, turn unit on, switch channel selector to desired channel and set RMO volume control half open. Set volume control on Executive for desired listening level. Peak the antenna coil on the converter board for best signal to noise ratio. This completes installation of RMO unit.

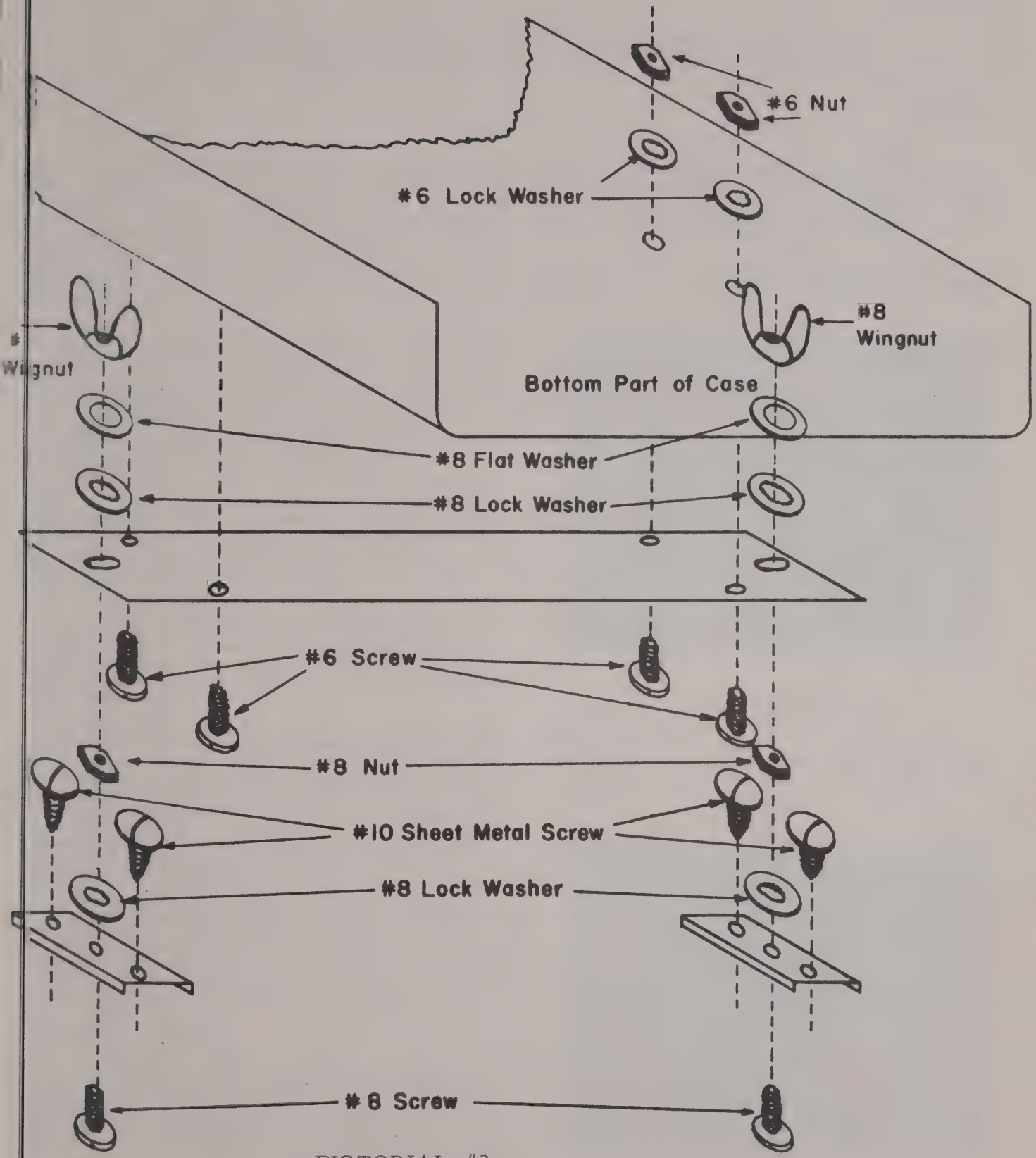
SHORT FORM OPERATING CHART

FUNCTION	CONTROL OR CONNECTOR
Connect antenna	ANT connector on transceiver rear panel
Connect power cord of desired voltage	POWER connector on transceiver rear panel
Connect 15 pin cable	Between RMO and transceiver
Install jumper plug	Between RMO jumper plug and hot DC voltage or use AC jumper plug for AC operation
Connect speaker (750-H only)	To green terminal bushing on RMO back panel
Connect 'S' meter (750-HB)	Between blue terminal bushing PL-7 on RMO back panel and PL-10 on main unit front panel
Turn squelch off	SQUELCH on RMO front panel
Turn set power on and set volume level	VOLUME on RMO front panel
Connect microphone	MIC connector on RMO front panel
Set HI-LO switch to desired range	HI-LO on RMO front panel (LO- 1 thru 12) (HI- 13 thru 23)
Transmit by pushing button on microphone	Push-to-talk button on microphone



PICTORIAL #1

EXECUTIVE MODEL 750-H



PICTORIAL #2

EXECUTIVE MODEL 750-H & 750-HB TRUNK MOUNT

ANTENNAE AND THEIR SELECTION

The most common antennae for citizen use are the Ground Plane and Coaxial for base use and the Vertical Whip for mobile use. The Yagi multi-element beam antenna can be used to great advantage where point-to-point communication is required rather than non-directional coverage from the base station. Any antenna with a directional gain will effectively increase the radiated power of the transmitter as well as the received signal applied to the receiver.

It is best to purchase a good commercially built antenna rather than attempt to construct your own. Good commercial antennae have low SWR (standing wave ratio) which is a merit of the radiation efficiency. With home constructed antennae it is sometimes difficult to effect a good match between the antenna and the transmitter causing considerable power to be lost in the system. An antenna should have an SWR of no more than 2:1.

Some power will be lost in the transmission line and therefore long runs should use the larger RG-8U cable. This cable has a lower loss per foot than the smaller RG-58/U. Both types have a characteristic impedance of 53 ohms. Loss per 100 feet at 27 megacycles is 1 db for RG-8/U and 2 db for RG-58/U. For short runs the RG-58/U cable is more easily handled.

Most of the antennae are available in two grades. The lower priced standard grade will not be as mechanically strong as the commercial grade. Electrically both grades are usually about equal. Where ice loads, wind, and salt air are a factor it will be cheaper in the long run to purchase the better antenna.

For extremely short range communication (less than a mile) the base loaded case whip antenna works very well. With two units using case whips, the signals will become quite weak after a block or two and poor squelch operation will be encountered. The outside antenna is by far the best choice and should be mounted as high as practical and still be within F.C.C. regulations. [Paragraph 95.25(c)]. In brief, the F.C.C. limits antenna height to no more than 20 feet above an existing structure or not to extend above the top of the radiating element on an existing tower. Remember the Yagi type antenna is usually mounted in a horizontal position. This type antenna must be used with another antenna mounted in the same plane. If the Yagi is to be used to communicate with mobile units using a whip antenna, the Yagi should be mounted in a vertical plane. A little thought in antenna installation will greatly improve your coverage.

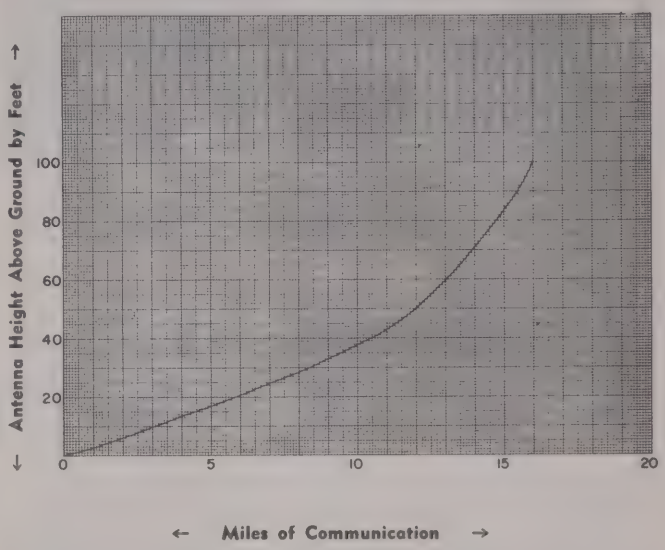
DISTANCE vs ANTENNA

The direct coverage you are able to obtain using Citizen Equipment in the 27 megacycle band will depend a great deal upon the antenna. We shall speak of direct coverage rather than skywave coverage wherein you may communicate 500 to 2000 miles at various times.

The F.C.C. has intended the Citizen use to be for short range communication and all installations should be calculated on this basis. The following charts consider a base station antenna mounted on a mast with the calculated range to a mobile unit using a standard 108" whip. Remember that the antenna may be mounted on an existing structure or mast [reference F.C.C. 95.24(c)].

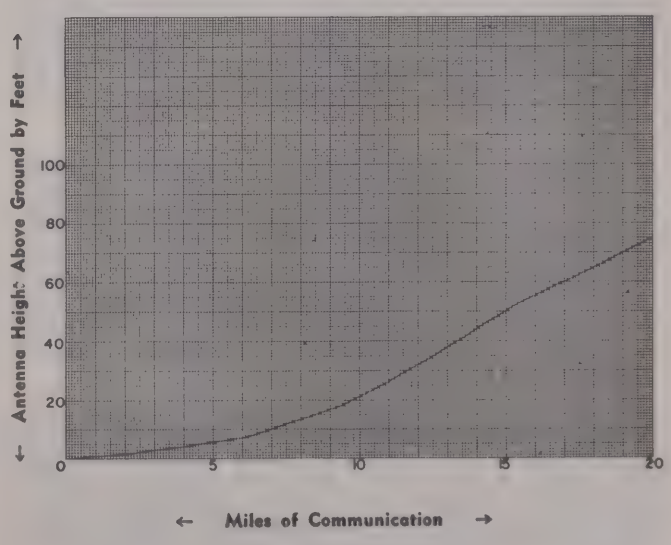
Ground Plane or Coax Antenna For 2 Microvolts at Receiver

Chart #1



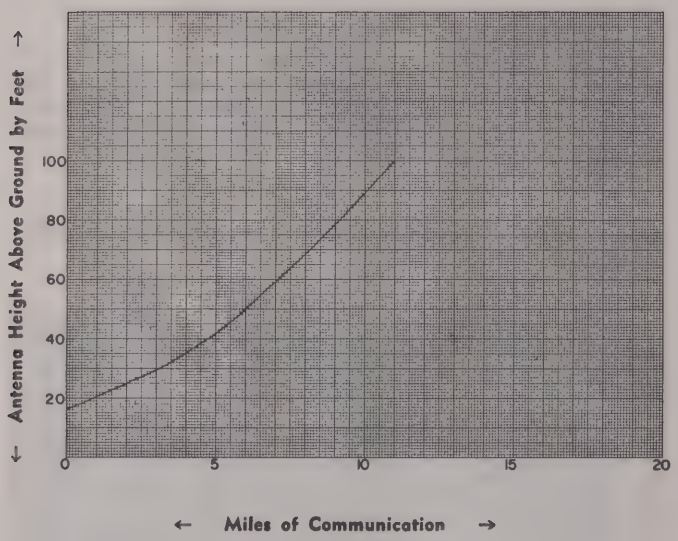
Yagi Antenna Mounted Vertical For 2 Microvolts at Receiver

Chart #2



Ground Plane or Coax Antenna For 15 Microvolts at Receiver

Chart #3



Note how the distance increases with increase height of the antenna for a given installation as in Chart 1. If a direction antenna is used as in Chart 2 you can see how the distance is further increased, however, this reduces the area covered since the Yagi Antenna is quite directional.

Charts 1 and 2 are based on a 2 microvolt signal at the receiver. This signal will not be sufficient for many city areas where high levels of noise exist. Chart 3 considers the coverage for 15 microvolts at the receiver and is more practical for general city use.

When the Citizen frequencies are open to skywave transmission, signals from distant stations will be strong enough to over power weak direct signals. When one is considering communication he should understand that for 100% contact he should base the calculations on 15 microvolts or more.

In mobile communication dead spots will be found at various points as well as locations giving excellent signals. These points should be noted and contacts made from the best possible locations. Vehicle noise and electrical interference will greatly reduce your communicating distance.

ELIMINATE YOUR MOBILE "NOISE GENERATORS"

Now that low cost TWO-WAY radio communication is available to everyone with the opening of the eleven meter band for Citizen use the number of mobile installations will probably exceed the number of base, or control, stations by a factor of 5 to 1 within the near future. It is estimated there are now over 160,000 citizen band mobile installations and approximately 45,000 base, or control, stations in operation. Proper installation and necessary steps towards the elimination of electrical, and mechanical, interference inherent in all motor vehicles is of prime importance if distances of three miles or more are desired to be covered.

For short range coverage the simple installation of a "radio condenser" on the generator and the "interference suppressor" installed in the top of the distributor, or coil, is usually sufficient noise suppression. But when maximum distances of three or more miles must be covered, great pains must be taken and all known means of noise suppression must be used. Different makes and models of vehicles will require different means of noise suppression. Some models only the very simple, others will need the "all out" method.

As there are numerous "generators" of radio interference in every motor vehicle the elimination of one source may not be noticeable as it's noise level may be below one you have not located so the proper way to approach your "noise" problem is by a systematic process of first suppressing all known offenders, namely the generator, voltage regulator, distributor and spark plugs.

We will explain throughout this article what is considered to be the proper vehicle noise suppression methods. The volume of noise you can, or will, tolerate in your receiver will depend upon the amount of suppression applied. Few installations will require the "all out" method and the user must decide when he is satisfied.

The purpose for eliminating your own "noise generators" is the fact that your receiver's automatic volume control (AVC) will react to these random noise pulses the same as though a strong station was tuned-in and will cut the receiver's sensitivity way down which will eliminate the weak stations you normally wish to copy. There's an old saying "if you can't hear them, you can't work them."

Let's start our "noise elimination" with the generator and voltage regulator. The generator is the item that causes the whine as the speed of the motor is increased. It is very easily detected by speeding up the engine and then cutting the ignition off. The instant the switch is turned off ONLY the generator and voltage regulator can cause the noise as all other "noise generators" are eliminated when the switch is off EXCEPT the generator as it is still in operation and is still trying to charge the battery through the voltage regulator. Even though it will operate only a few seconds after the switch is off this is time enough for you to hear the terrific amount of noise it is generating. As the speed of the engine decreases the whine will decrease in unison.

Practically all vehicle manufacturers cable the two leads from the voltage regulator to the generator in a harness with other wires. It is recommended that both of these wires be run in **separate** tinned copper braid. Just disconnect the present wires from the generator and the other end of them at the voltage regulator's "A" and "F" terminals. They can be cut-off where they enter the harness or just taped down out of the way.

A Sprague 48P18 coaxial capacitor, or a similar .5 mfd coaxial capacitor, should be installed directly ON the generator and the lead from the condenser to the battery armature terminal of the generator must be as short as possible. In fact a length of one inch is sometimes too long. A .001 mfd mica capacitor should now be installed from the same battery terminal to the frame of the generator, here again lead length is extremely important and they should be no longer than one-quarter inch. Be sure to remove paint and grease on the generator where the capacitor is bolted as a "good" ground at this point is necessary.

Dress the cable from the coaxial capacitor on the generator against the body of the car. Use speed clips to keep in place or run through presently installed cable clamps. This cable is usually the longest "noise generator" we must suppress and it is preferred to shield this wire in tinned copper braid. The end of the braid must be soldered directly to the coaxial capacitor's body. Be sure to use size #12 copper stranded wire when making-up this new lead. Connect a new cable to the generators' "F" (field) terminal and run this lead in a tinned copper braid shield and dress it along side the battery lead. This new lead may be of size #16 copper stranded wire.

The voltage regulator is next and the "job" from here on is usually easy compared to the one just completed. Remove the cover from the voltage regulator and clean off any paint that may insulate the cover from the frame. Check the mounting screws and be sure the regulator is being grounded directly to the firewall. If necessary remove and clean away any paint so you may secure a "perfect" ground connection.

Use two 48P3 of 48P5 Sprague coaxial capacitors or similar .1 to .5 mfd coaxial capacitors and install at the "A" and "B" terminals of the regulator. The capacitors metal body must be grounded directly to the firewall. This can be easily accomplished by using a piece of cadimun plated metal about 4" x 4" bent to a 90° angle. Drill two holes for the capacitors and two holes to pass sheet metal screws to bolt to the firewall. Attach the capacitors to the angle with screws and nuts and **also** solder. Locate the assembly so the lead from each capacitor to the "A" and "B" regulator terminals are extremely short. Be sure to clean the paint from the firewall so the bracket will make a good solid ground connection. Attach the cable from the generator's "F" terminal to the voltage regulator's "F" terminal. Connect a .002 mfd capacitor and a 4 ohm resistor, in series, from this point to ground. Again, lead length is important and the overall length of the capacitor-resistor combination must be as short as possible. Attach the lead from the generator's armature terminal to the coaxial capacitor connected to the voltage regulator's "A" terminal. The shielding braid on these leads must be grounded to the capacitor bracket or to the firewall by soldering or with the use of washers and sheet metal screws. Attach the "B" battery lead to the coaxial capacitor connected to the "B" terminal of the voltage regulator. This is the lead coming through the firewall and usually goes direct to the battery charging indicator on the vehicles dash panel.

The next superb "noise generators" of them all are the spark plugs. But here we have available to us years of research for only a few dollars. Just go to your local auto supply store and purchase a complete set of AUTO-LITE RESISTOR spark plugs that are direct replacements for your particular brand and model of vehicle. CAUTION: We own no stock in Auto-Lite, but please accept no "substitute" as some **resistor** plugs will actually increase your noise problem. Be patient, if your dealer does not stock your size just ask him to get them for you. When installing the new plugs be sure to have the gap properly set.

After **properly** installing the "recommended" suppression to these trouble makers you should be able to drive comfortably and communicate with stations you never heard before with your engine running. However, in most cases this is only the beginning of the job in order for you to say that you have a good mobile installation.

If you have been checking your "noise elimination" progress as you complete each step we know you will be extremely pleased with your work. But from here on each suppression job will not be very noticeable until you hit the one big joker that's causing a lot of trouble. The little "noise generators" will be obscured by this one and wouldn't have showed up until it was eliminated. All-in-all the little ones can really add up and must be taken care of in due time.

Have your distributor checked to see that the capacitor across the breaker points has the proper capacitance and the points are properly set. If the vehicle has been driven 30,000 to 40,000 miles or more it is recommended that the distributor cap and rotor be replaced. This will usually not only reduce the ignition noise, but also improve the overall performance of the engine. At the same time have the timing checked and properly adjusted.

When purchasing your new AUTO-LITE resistor spark plugs also buy enough 4,000 ohm-per-foot ignition cable to make up a new wiring harness from the distributor to the spark plugs. Be sure that the new terminals (ferrules) are installed whereby they make **good** contact with the center conductor of the new cable. It is preferred that the ferrules be soldered rather than crimped on as there is danger of a poor contact causing another "noise generator" to appear.

Check your ignition wiring by shorting out each plug, in turn, while listening to the receiver. Any reduction in the noise level will usually indicate that the ferrules are not making good contact in the distributor head, or the ferrule and center conductor should be soldered.

Install a 10,000 ohm carbon suppressor in the distributor's center terminal and make up a new lead to run to the coil. Here again be sure the ferrules are soldered and are making a "tight" connection inside the coil and distributor. A new lead is recommended here as any breaks what-so-ever in the ignition system's wiring insulation could be a source of "ignition noise." With very short leads connect a .001 mfd disc ceramic capacitor from the coil's battery terminal to the coil's case.

Bonding braid should now be run from the fire wall, coil, and the distributor to the engine. Use as short a piece of braid as possible in each case. If the ground lead of the battery is attached to the fire wall it should be removed and attached to the starter mounting bolt. The power cable ground lead for your transceiver should also be connected at this same point. Usually the hot and ground leads from the battery go direct to the starter's

solenoid which is mounted on the starter and this is a good place to connect the transceiver's power cable. CAUTION: Remove the hot cable from the battery before making connections to the starter as there is danger of the hot battery cable getting loose and shorting out the battery or even starting a fire.

Connect a short piece of bonding braid across each engine hood hinge. NOTE: The hood will act as a shield to help keep the engine noise inside the engine compartment and away from your antenna. Next connect a short length of bonding braid across each trunk lid hinge, front of the engine to the frame, exhaust tail pipes to the frame, and a piece of wire braid from the air cleaner to the fire wall. It is very important that we caution you to be sure that you clean away all paint, grease or insulation material when installing the grounding braid as **good,** low resistance, ground connections must be made.

Noisy tires should be treated with an anti-static powder, brake shoes grounded to the backup plates with bonding braid and static collectors installed inside the front wheel grease retainer cups. Heat and oil indicator sending units on the engine must be by-passed with .1 to .5 mfd capacitors, again using very short leads. All instrument panel gauges and accessories should be by-passed using .5 mfd capacitors. Heater and defroster motors, electric windshield wiper motors and any other accessory motors by-passed with a .25 to .5 mfd capacitor. The gasoline sending unit mounted on the gasoline tank must be by-passed with a .1 to .5 mfd capacitor. An inspection plate is usually provided in the trunk compartment over the tank.

For the person who desires the "ultimate" in mobile "noise elimination" there are available for some vehicles marine and aviation spark plugs that could be used and the complete ignition system shielded by using these plugs and making metal boxes to enclose the distributor and coil, and shielding all wiring associated with the ignition system. By having the ignition system **completely** shielded most of the "suppression" can be eliminated and the normal high engine performance will be maintained.

You should set aside a week-end for your "noise elimination" project and have all necessary parts and tools available. You may visit your local two-way radio communications company and secure most of the parts required in kits furnished by some manufacturers of two-way radios. The other parts required are available from radio parts supply and auto parts supply firms.

Lay out your line-of-attack and as each "noise generator" is suppressed it should be noted and checked by listening to the receiver or noting the receiver's "S" meter indication before and after the suppression. This indicates the noise level entering the receiver that is being picked-up by the antenna. To check the noise level entering the receiver by the antenna connecting cable disconnect the cable where it connects to the antenna and short the cable's terminals. If noise is still noticeable it will be necessary to re-route the cable under the vehicle and up through the fire wall to the transceiver. Check the noise level entering the receiver through the power cable by disconnecting the antenna connecting cable at the receiver. All noticeable noise in the receiver is now being picked-up by the power cable and fed to the receiver. This can usually be eliminated by installing a Sprague 48P3 feed-thru coaxial capacitor on the fire wall and the hot battery lead from the transceiver connected through the capacitor to the battery terminal.

We sincerely hope that we have been of some help to you and assure you that when you finish your "noise elimination" project you will consider yourself an "**expert.**" But just as a parting reminder, remember that all of those cars along side of you, up front, behind and the ones passing have not been through the "elimination" process and it will be up to your receiver's built-in noise limiter to cut **their** noises down to a listening level that is bearable.

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From Class "D" Citizens Band Radio 1960 Call Book

SECTION IV

ACCESSORIES

RMO-24HB

This remote control unit complete with table top mount and interconnecting cables may be purchased as a separate unit for use in connection with any International model 750-H trunk unit. This allows the user to convert his mobile installation to a base station by simply disconnecting and removing the trunk unit and making necessary interconnections (ant. & power) with the RMO-24 HB at the base station location. Stock No. 150-271 $179.50

ANTENNAS

Without an efficient antenna, operation of your Executive is not as enjoyable as can be experienced with a well designed antenna system. INTERNATIONAL has available antennas for almost any installation. Base Station end fed vertical antenna,
Stock No. 160-116 price $28.43
Roof Top Mobile Antenna, Stock No. 160-119 price $15.68

POWER PLUGS

For our customers who have only one unit and wish to use it in several different locations, INTERNATIONAL offers five different power plugs which will allow the Executive unit to be used anywhere.

6 VDC	plug	-gnd	Part No. 150-259	Price ea.	$7.50
6 VDC	plug	+gnd	Part No. 150-260	Price ea.	$7.50
12 VDC	plug	-gnd	Part No. 150-261	Price ea.	$7.50
12 VDC	plug	+gnd	Part No. 150-262	Price ea.	$7.50
115 VAC	plug		Part No. 150-174	Price ea.	$7.50
AC or DC	plug kit		Part No. 150-257	Price ea.	$3.95
AC	jumper plug		Part No. 150-267	Price ea.	$3.50
DC	jumper plug		Part No. 150-268	Price ea.	$3.50

'S' METER KIT

Designed for installation in the speaker grill opening of the Executive Model 750-H transceiver, this accessory allows the operator to visually monitor the relative signal strength of received signals.

Stock No. 150-263 Price ea. $19.95

SECTION V

SERVICE AND MAINTENANCE

GENERAL

As is the case with all types of electronic equipment, the EXECUTIVE should be checked periodically by a qualified technician to insure optimum performance at all times and to correct any condition which might later result in equipment failure due to improper adjustment, tube aging or component failure. Since the EXECUTIVE series receiver differs somewhat in its design from coventional Citizen Band radio sets, no attempt should be made to service this equipment until the technician has become completely familiar with the basic circuitry and has a thorough understanding of the characteristics of dual conversion equipment.

In general, maintenance can be simplified by seeking a definite symptom of a fault and establishing, by reference to the block and schematic diagrams, a condition or series of conditions which might cause the symptom. This will usually help to localize the source of trouble and eliminate those sections of the equipment which are operating properly.

Many technicians tend to overlook the very simple and more obvious sources of trouble in their service work. This may be brought about by a nontechnical operators description of a particular fault. For example, a Citizen Band operators complaint of intermittent operation may immediately suggest relay trouble or any number of things to a technician. Yet, upon checking further, the trouble may actually be caused by a defective antenna connector or loose microphone plug or some other condition completely external to the set. For this reason, always quickly check the entire installation for potential trouble before actually removing the set for maintenance work.

DISASSEMBLY OF THE CABINET

Trunk unit- The front and rear panels of the unit are bolted to the chassis. The cabinet is of wrap-around construction divided into two pieces. The perforated top section may be removed for easy acces to all tubes without removing the bottom section. Remove the six (three on each side) large sheet metal screws and fibre washers and lift off the top section. To remove the bottom section remove the four sheet metal screws located inside the rubber feet and two additional sheet metal screws one at the back and one at the front on the bottom of the unit.

To re-assemble, simply reverse the procedure outlined above.

RMO-24H

The top cover is secured in place by three sheet metal screws on each side of the case. Remove the sheet metal screws, spring the top cover sides outward and lift off. To re-assemble, simply reverse the procedure.

RMO-24HB

This case is of two piece construction. The main case is secured to the back panel by two snap fasteners on each side of the case. Remove fasteners, swivel bolts and slip unit out of case from the back side.

TEST EQUIPMENT

A properly equipped Citizen Band service shop will probably have most of the basic test equipment for servicing the INTERNATIONAL EQUIPMENT. Because of the much closer frequency tolerances used on Citizen Band radio equipment, greater precision is required of all alignment generators and frequency measuring equipment. A good stable HF signal generator will be most helpful when alignment of the receiver is necessary. Hewlett-Packard type 606-A signal generator is a good example of the type and quality of instrument which has the inherent stability and accuracy that is desirable for servicing Citizen Band radio equipment. An accuracy calibrated attenuator with an auxiliary pad to reduce the generator output to 0.25 microvolts or less is very desirable for absolute receiver sensitivity measurements.

For receiver audio recovery measurements, the Heath Model AV-3 Audio Vacuum Tube Voltmeter will provide the necessary accuracy required in this test.

For frequency measurement and modulation percentage checks, the INTARNATIONAL Model C-12B Frequency meter is highly recommended. This versatile instrument specifically designed for use on the Citizen Band Channels, allows the technician to make accurate frequency and modulation checks with the minimum of set up time. The instrument can also be used as an accurate frequency standard for calibration of other equipment on Citizen Band channels.

An adequate source of well filtered low-voltage DC which can be varied over a minimum range of 5 to 15 volts with ample current capacity for good regulation is extremely desirable for service work. Although several automobile batteries can be used with taps at each cell to provide a crude range of adjustment, the upkeep and long range maintenance cost will invariably prove to be more costly than a good battery type of DC supply. One unit of this type is the Heath Model BE-5. Regulation and filtering are adequate for use directly without the need for batteries.

NOTE: Detailed information and prices on the instruments mentioned above may be obtained by contacting the appropiate manufacturer at the address listed below:

Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif.
Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio
International Crystal Manufacturing Co., Inc., 18 N. Lee
Oklahoma City 2, Oklahoma
Heath Company, Benton Harbor, Michigan

PREVENTATIVE MAINTENANCE

Wherever possible, a routine program of preventive maintenance should be set up on all INTERNATIONAL Executive radio installations in order to insure maximum equipment utilization with the least number of interruptions for service work. The following list has been prepared as a guide to indicate items which should be included in a preventive maintenance program. Unusual environmental or installation conditions may make it necessary to expand or alter this list to meet individual requirements in the field.

GENERAL

Check all plugs, connectors, tubes, and fasteners for proper seating. Where equipment is subjected to extremely dusty conditions, occasionally remove the set from its case and dust with a clean, dry brush or with a clean, DRY source of compressed air. Clean the relay contacts only by drawing a small strip of ordinary bond letter paper between the contacts while holding gentle pressure on the relay armature. Do not use a file, sandpaper or any abrassive on relay contacts. The contacts are gold-plated and need only occasional cleaning to remove dust or foreign material. Vacuum or brush out any dust in the case before reinstalling the set.

MOBILE INSTALLATIONS

Check the battery connections. These must be clean and tight at all times. Check the battery at frequent intervals for condition and electrolyte level. Add water, as required, to keep the electrolyte at the proper level.

Inspect the power cable for evidence of physical damage. Check the microphone plug, cable and hanger bracket. Check all plugs and connectors for proper seating and security. Inspect the antenna system carefully. Remove the antenna plug from the set and check for continuity between the center contact of the plug and the actual antenna rod with a low range ohmmeter. Straighten or replace any bent or damaged antenna rods.

Check the voltage regulator for proper operation with the engine running. Adjust the regulator, if necessary, to prevent a voltage in excess of 7.5 volts on 6 volt systems or 14.5 volts on 12 volt systems when the generator is operating at its maximum output.

Inspect the distributor and spark plug wiring. Be sure all terminals are clean, bright and fit securely.

BASE STATION INSTALLATIONS

Check the primary line voltage to make certain it is within its normal limits. If the line voltage is subject to very large fluctuations, install a constant voltage transformer of appropiate capacity.

Inspect the microphone plug, cable and hanger bracket for evidence of excesive wear or damage. Check the antenna system, including the mast or tower, guy wires and coaxial cable. Be sure to inspect the ground wire for the mast or tower. All connections at the tower and ground rod should be clean and tight.

MINIMUM PERFORMANCE

The following routine measurements should be made at periodic intervals. If within the range indicated below, the set can be considered in good operating condition.

1. Check the receiver as follows with no signal input. This can be measured with a VTVM and audio output meter. The Volume control should be wide open, Squelch control OFF, Channel Selector set at Channel 9. The AVC voltage at terminal #30 on the IF unit should be from —.1 to —.3 and Audio Output across speaker terminals .5 VAC or less. Typical meter readings with a 1 uv 400cps 30% modulated signal are —.9 or more volts AVC and 1.75 volts AC or better on the audio output meter.

2. Check the transmitter power output with an RF wattmeter. Rated output at standard input voltages of 6.8, 13.6 and 115 volts should be measured. (Normal 2 to 2.5 watts)

3. If a reflected power meter is available, check the reflected power when transmitting. The reflected power ratio should be 1.5 to 1 or better if the antenna, coax and transmitter are properly matched.

4. Check transmitter output frequency. Frequency should be .005% or better.

TROUBLE LOCALIZATION

To correct any trouble which may occur in the equipment, first try to isolate the section of the set which causes the trouble. In many instances a good visual inspection of the set will clearly indicate where the defective component is located. Reference to the block diagram of circuit functions and the schematic diagrams on the various sections of the receiver, transmitter and power supply, together with the following list of typical symptoms with probable sources of faults will be helpful in servicing the equipment.

When tubes are indicated as being the cause of the trouble, substitute a new tube of the same type for the one suspected of failure. If no improvement is noted, the original may be reinstalled. It should be noted that where tubes are referred to as trouble possibilities, the circuit components immediately associated with that particular tube may also be the source of trouble.

In trouble shooting the equipment, first check the power supply on 6 and 12 volts DC and 115 volts AC. If trouble is not in the power supply, all further checks can be made on 115 volts AC.

Connect a 115 volt power cord to the unit and remove the antenna and connect a dummy load. The dummy load can be made by connecting a #47 pilot lamp across a spare antenna plug and plugging this into the antenna jack of the unit.

VOLTAGE MEASUREMENTS

The voltages measured at pertinent tube socket pins as well as power pin terminals are shown in the table just preceeding the sectional schematic diagrams at the back of this manual.

The receiving condition voltages are preceeded by the letter 'R'. Transmitting condition voltages are preceeded by the letter 'T'. The filament voltages are not marked AC or DC, as this will depend on whether or not the unit is being operated on the AC line or on battery input voltage.

All voltage readings were taken with unit operating from 115 volts AC. Voltages measured when using battery input voltage will differ somewhat from those shown for 115 volt operation.

POSSIBLE TROUBLE CHART

COMPLAINT	POSSIBLE TROUBLE	REMEDY
POWER SUPPLY		
No B+ voltage (AC or DC)	fuse, switch, rectifiers	replace defective parts
No B+ voltage (DC)	fuse, transistors, Q1 & Q2	replace defective parts
	bad connection on power cable	repair cable
	defective transistor	replace defective parts
	transformer 512-118A	replace defective parts
	resistors R66 & R67	replace defective parts
B+ Low (DC)	battery output low	charge battery
	loss in power cable	correct defect in cable
	defective transistors Q1 & Q2	replace defective parts
	resistors R66 & R67	replace defective parts
B+ Low (AC or DC)	short in B+ line	remove short
	low resistance B+ line to ground	remove defective part
	defective rectifiers	replace defective parts
	defective power transformer	replace defective parts
TRANSMITTER SECTION		
No RF output	defective V10, V11, V12, or V13	replace tube/s
	open L14 or RFC-9	replace coil/s
	open L9, L12, L17, L19 or RFC-6	replace coil/s
	open C91	replace capacitor
	open secondary winding of modulation transformer T-6	replace transformer
	defective transmitter crystal Y-15 or Y16	replace crystal/s
	poor relay contacts	clean contacts
Low RF output	L10, L12, L17 or L19 improperly adjusted	re-adjust coils as per recommended procedure
	C89 & C90 improperly tuned	re-adjust capacitors
	weak V8 or V9	replace tube/s
No Modulation	defective V7, V8 or V9	replace tube/s
	defective modulation transformer T-6	replace transformer
	mike gain control on audio board improperly adjusted	re-adjust as per recommended procedure
	clipper control R51 improperly adjusted	re-adjust as per recommended procedure
Low Modulation	check as per above Low Grid Drive to V11	check V10 & alignment of coils L10, L12, L17 & L19

COMPLAINT	POSSIBLE TROUBLE	REMEDY
RECEIVER SECTION		
Dead (no sound)	defective V1, V2, V3, V4, V5, V6, V7, V9	replace tube/s
	open audio filter cjoke L10	replace choke
	shorted capacitors C64 or C65	replace capacitor/s
	defective crystal Y-1 or Y-2	replace crystal/s
	dirty relay contacts	clean contacts
Low Volume	defective tube as listed above	replace tube/s
	receiver requires alignment	align as required

TRANSMITTER ALIGNMENT

For proper alignment of the Executive model 750-H or 750-HB transmitter, it will be necessary to have the following test equipment.

(a) RF Wattmeter-Bird Model 43 or equivalent

(b) Frequency Meter with an accuracy of at least .0025% International Crystal Model C-12B

(c) Vacuum Tube Voltmeter H.P. 410-B or RCA WV98-B or equivalent

(d) Audio Oscillator H.P. 650-A or Heath AG-9 or equivalent

(e) Oscilloscope H.P. 152 or Heath 10-30 or equivalent

(f) Oscilloscope Converter International Mobilette

(g) Oscilloscope Converter Attenuator International

(h) 6 VDC battery for converter. Burgess F4P1 or equivalent

Since the Executive Models 750-H and 750-HB transceivers employ the frequency synthesis method of generating the transmitter output frequency, it is best to first make several preliminary tests to determine whether or not it is necessary to adjust the trimmer capacitors C107, C108 or C111. Normally these capacitors will not have to be adjusted and since such adjustments will require some rather precise frequency measuring, it is best that they be changed only as a last resort.

Using a C-12B Frequency Meter, check the frequency of each channel from 1 thru 23. If they check within ± 800 cps of the channel frequency, no adjustment of these capacitors will be necessary.

If the majority of the channels are out of tolerance, either too high or too low, it will be necessary to adjust capacitor C111 mounted on top of the crystal switch assembly in the RMO as follows:

1. Let us assume that in the initial frequency check we find all channels checking from 900 to 1500 cps high in frequency. This will result in out of tolerance operation on some channels and capacitor C111 should be adjusted to return the channel frequencies to within 800 cps of zero frequency.

2. Switch the CHANNEL selector dial to the channel that was the furthest off frequency.

3. Using a C-12B Frequency Meter as before, set the Frequency Meter to the same channel selected in step two above. Key the transmitter with the LOCAL-REMOTE switch and then key the C-12B. Carefully adjust trimmer C111 in a clockwise direction until the C-12B indicates the transmitter frequency to be within +800 cps of zero frequency.

4. Check all channel frequencies again and you should find they are now lower in frequency than they were on the initial check. All channels should now be within ± 800 cps of zero frequency. If the initial frequency check indicated all channels were on the low side, reverse the procedure described above in steps 2, 3 and 4.

5. If the initial frequency check indicated that all channels 1 thru 12 were out of tolerance on the high side and channels 13 thru 23 were on frequency this would indicate the LO channel 10.000mc heterodyning crystal Y-16 needs to be trimmed to frequency with capacitor C107.

6. The procedure here is the same as that outlined in steps 2, 3 and 4. The only difference being that trimmer C107 is adjusted to bring crystal Y-16 on frequency.

7. If channels 13 thru 23 were out of tolerance and channels 1 thru 12 were on frequency, this would indicate the HI channel 10.150mc heterodyning crystal Y-15 needs to be trimmed to frequency with capacitor C108. The procedure will be the same as outlined in paragraph 6 above.

After it has been determined that the transmitter is on frequency, set the CHANNEL selector dial on channel 1 ane the HI-LO switch in the LO position. Using a VTVM measure the grid drive to the final amplifier at the green PA test jack on top of the power supply chassis. The voltage should not be less than a -25VDC. Rotate CHANNEL selector to channel 2 and check voltage at test jack. Repeat this procedure for each successive channel thru channel 12.

Next place HI-LO switch in HI position and CHANNEL selector on channel 13 and check voltage at PA test jack. Repeat this procedure for each successive channel thru channel 23. The voltage should not be less than -25VDC on any channel from channel 1 thru channel 23. The grid drive may vary about 10 volts from channel 1 thru channel 23.

If the voltage at the PA test jack falls within the limits described above, no adjustment of the RMO coils L17 and L19 or coils L10 and L12 in the trunk unit will be necessary. The transmitter RF power output should be fairly constant over the entire range from channel 1 thru 23. This should be a minimum of 2.5 watts on all channels.

If the transmitter does not perform satisfactorily, it may be re-aligned as follows:

1. Set CHANNEL selector on channel 23 and adjust RMO coils L17 & L19 for maximum grid drive at the grid of the 6BH6 V-10 pin 1, use the RF probe of the VTVM.

   CAUTION: It is possible to tune coil L19 to the second harmonic of the 17mc crystals. If this is done it is possible to completely tune up the transmitter in the 24mc region as follows: L19 is tuned to 34mc coil L17 will not resonate at 44mc but will tune to the difference frequency of 34mc and the 10mc crystals Y-15 or Y-16. One of the symptoms of this misalignment is low grid drive and consequently low power output. In view of this it is always best to check the output frequency of L19 with a frequency selective voltmeter. Always check each channel frequency with a C-12B frequency meter after the unit has been realigned.

2. Set CHANNEL selector on channel 13 and adjust transmitter PA grid coil L12 for maximum grid drive at test jack.

3. Set CHANNEL selector on channel 9 and adjust transmitter buffer plate coil L9 for maximum frid drive at test jack.

4. Tune transmitter plate and loading capacitors C89 and C90 for maximum output on channel 9.

5. Remove excitation from the buffer and final amplifier by disconnecting the B+ lead from power pin #59 on the RMO printed circuit board. Now rotate transmitter tuning capacitor C89 and check neutralization of the final amplifier for RF output as indicated by wattmeter.

If wattmeter indicates RF power output as capacitor C89 is rotated from minimum to maximum adjust neutralizing loop L13 and rotate capacitor C89. Repeat process until no output is indicated by the wattmeter.

When the final amplifier is completely neutralized, replace the lead to power pin #59. Now tune transmitter tuning and loading capacitor C89 and C90 for maximum output on channel 9 as indicated by the wattmeter.

MICROPHONE GAIN AND SPEECH CLIPPER LEVEL CONTROLS

The microphone gain control R43 is mounted on the audio board. Access to this control is thru a hole in the top of the transceiver case. This control varies the output level from audio amplifier V7A.

The clipper level control R51 is mounted on the clipper printed circuit board. Access to this control is thru a hole in the front panel of the trunk unit. This control varies the output level from microphone pre-amplifier V8 to the clipper circuit.

Connect unit under test to test equipment as shown in FIG. 1.

Set Executive controls as follows:

1. Microphone gain and clipper level controls fully clockwise.
2. RMO CHANNEL selector dial to channel 9.
3. RMO HI-LO switch to LO position.
4. Place the power switch in RMO in ON position.

Set test equipment controls as follows:

1. Set audio generator frequency at 1000 cps and output to zero.
2. Set scope up as follows:
   (a) Horizontal Frequency Selector from 100 to 1000 cps.
   (b) Sync. Selector to +internal.
3. Set vertical input attenuator and vertical gain to mid-range.

Proceed with Executive adjustment as follows:

1. Place LOCAL-REMOTE switch in LOCAL position.
2. Adjust transmitter PA tuning and loading capacitors C89 and C90 for maximum output as indicated by vertical deflection on oscilloscope.
3. Adjust oscilloscope vertical gain control until carrier occupies five scale divisions above and below base line.
4. Adjust audio oscillator output level to .1 VAC.
5. Adjust Horizontal Freq. Vernier until sync. is obtained.
6. Adjust scope Horizontal Gain for a display similar to that of FIG. 2C.
7. Adjust Executive microphone gain control for a display similar to FIG.2B.

8. Reduce audio generator output to .05 VAC.

9. Adjust Executive CLIPPER LEVEL control for a display similar to FIG. 2D.

10. The above adjustment procedure pre-sets modulation percentage level for 100% modulation on negative peaks when talking close to the microphone.

11. When using the converter method for observing the modulation percentage it is always best to base the adjustments with reference to negative peaks since some compression may occur in the converter. In view of this the resulting waveform display may not be truly representative with respect to the positive peaks.

RECEIVER ALIGNMENT

Prior to alignment, the Executive transceiver should be allowed to reach normal operating temperature. This will require approximately 15 minutes when operating from 115 VAC.

Alignment of the Executive receiver is performed by adjustment of the various stages as follows:

1. The following test equipment will be required for proper alignment of the Executive Model 750-H or 750-HB receiver.

   (a) RF Signal Generator such as the H.P. 606-A, Clough-Brengle 550 or equivalent. It is important if accurate sensitivity measurements are to be made that the signal generator have good attenuator and very little signal leakage. A generator such as the Heath LG-1 may be used providing an external attenuator having an attenuation of approximately 60 DB is used between the generator and the transceiver. The generator is then operated on its higher output ranges.

   (b) Crystal controlled frequency standard such as the International C-12B Frequency Meter.

   (c) Audio output meter such as the H.P. 400-D, Heath AV-3 or equivalent.

   (d) Vacuum tube voltmeter such as the H.P. 410-B, RCA WV-98B or equivalent.

   (e) Combination attenuator 6 DB +50 DB International #150-224.

2. Set transceiver controls as follows:

   (a) VOLUME control on RMO ON and fully clockwise.

   (b) SQUELCH control on RMO fully counterclockwise until it clicks off.

   (c) CHANNEL selector dial to channel 9.

   (d) HI-LO switch to LO position.

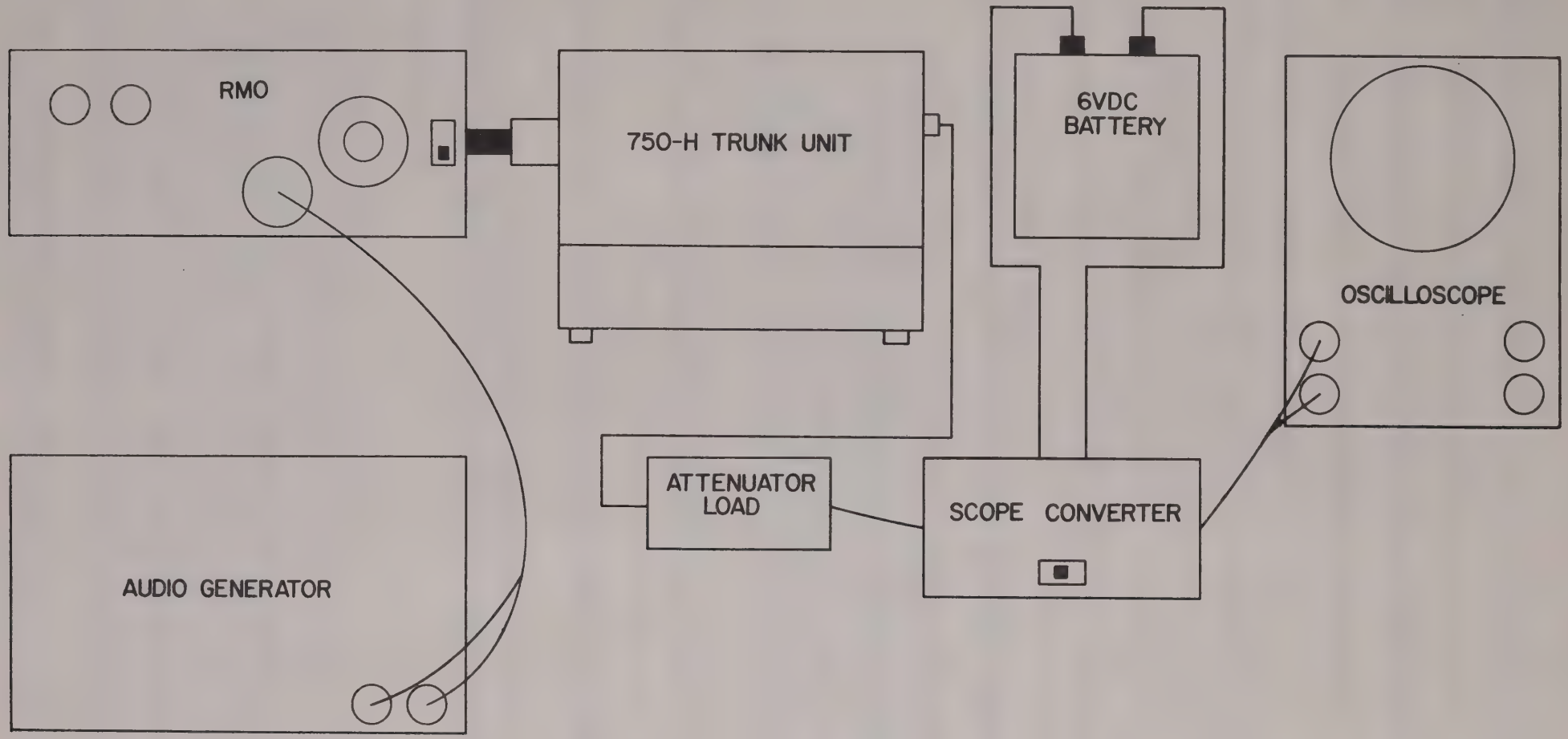
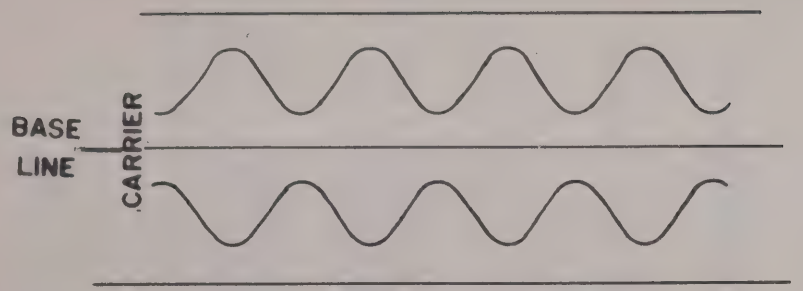
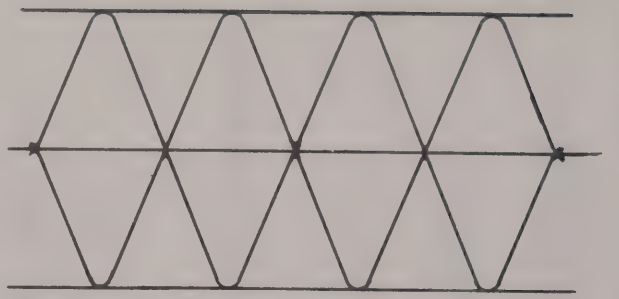

RMO
750-H TRUNK UNIT
6VDC
BATTERY
OSCILLOSCOPE
ATTENUATOR
LOAD
SCOPE CONVERTER
AUDIO GENERATOR

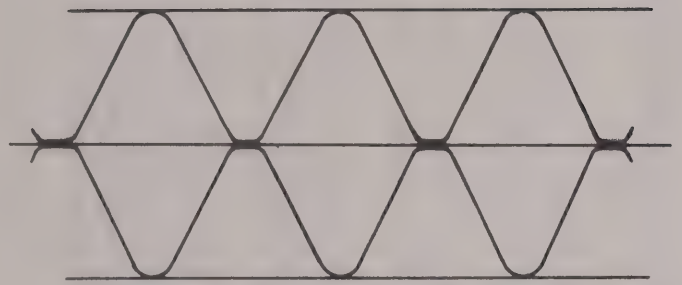
FIG. 1



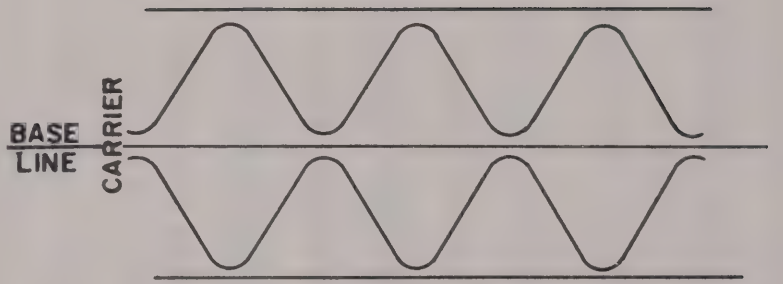
LESS THAN 100% MODULATION
ON BOTH NEGATIVE
AND POSITIVE PEAKS
2A



100% MODULATION ON
POSITIVE AND NEGATIVE PEAKS
2B



MORE THAN 100% ON NEGATIVE PEAKS
100% ON POSITIVE PEAKS
2C



2D

FIG. 2

(b) Crystal controlled frequency standard such as the International C-12B Frequency Meter

(c) Audio output meter such as the H. P. 400-D, Heath AV-3 or equivalent.

(d) Vacuum tube voltmeter such as the H. P. 410-B, RCA WV-98B or equivalent.

(e) Combination attenuator 6 DB / 50 DB International #150-224.

2. Set transceiver controls as follows:

(a) VOLUME control on RMO ON and fully clockwise.

(b) SQUELCH control on RMO fully counterclockwise until it clicks off.

(c) CHANNEL selector dial to channel 9.

(d) HI-LO switch to LO position.

(e) Mark position of AUDIO LEVEL control on trunk unit front panel and then turn fully clockwise.

3. Connect test equipment to transceiver as shown in Fig. 3.

4. Set attenuator switch to the IN position.

5. Set C-12B CHANNEL selector switch to channel 9 and FUNCTION switch to the RF position.

6. Connect VTVM probe to AVC power pin (#21) on 1st I. F. board. Connect VTVM ground lead to transceiver chassis.

7. Press C-12B PWR switch to ON position and adjust RF level control for a -1 volt DC reading on the VTVM.

8. Carefully adjust both top and bottom slugs in I. F. transformers T-1 thru T-5 for maximum reading on VTVM. If necessary reduce RF LEVEL from C-12B to maintain an approximate reading of -1 volt on the VTVM.

9. Reduce RF LEVEL from C-12B until AVC voltage is approximately -.5 VDC. Set VTVM range switch to low range (1 volt on H. P. 410B or 1.5 volt on RCA WV-98B) and repeat above process being careful to get each tuning slug set for maximum reading on VTVM.

(e) Mark position of AUDIO LEVEL control on trunk unit front panel and then turn fully clockwise.

3. Connect test equipment to transceiver as shown in FIG.3.

4. Set attenuator switch to the IN position.

5. Set C-12B CHANNEL selector switch to channel 9 and FUNCTION switch to the RF position.

6. Connect VTVM probe to AVC power pin (#21) on 1st IF board. Connect VTVM ground lead to transceiver chassis.

7. PressC-12B PWR switch to ON position and adjust RF level control for a —1 volt DC reading on the VTVM.

8. Carefully adjust both top and bottom slugs in IF transformers T-1 thru T-5 for maximum reading on VTVM. If necessary reduce RF LEVEL from C-12B to maintain an approximate reading of -1 volt on the VTVM.

9. Reduce RF LEVEL from C-12B until AVC voltage is approximately —.5 VDC. Set VTVM range switch to lo range (1 volt on H.P. 410B or 1.5 volt on RCA WV-98B) and repeat above process being careful to get each tuning slug set for maximum reading on VTVM.

10. Adjust coil L8 on receiver OSC-MIXER board for maximum reading on VTVM.

11. Adjust coil L2 on CONV. board for maximum reading on VTVM.

12. Switch CHANNEL selector on C-12B and RMO to channel #1 and adjust coil L4 on CONV. board for maximum reading on VTVM.

13. Switch CHANNEL selector on C-12B and RMO to channel #23. Set RMO HI-LO switch to the HI position and adjust coils L1, L3 and L6 for maximum reading on VTVM. Adjust slug in coil L6 at top of coil. Slug will be 1/4 to 1/2 its length out of the coil. Secure in place with RTV compound.

14. Switch CHANNEL selector on C-12B and RMO to channel #9. Set RMO HI-LO switch to LO position. Set VTVM range switch to a range that will handle about 5 volts at midscale or a little less. Adjust C-12B RF level for a reading of -3 to -5 volts on the VTVM. Note reading.

15. Release C-12B PWR switch and set C-12B CHANNEL selector to channel #8. Set attenuator switch to the OUT position and press C-12B PWR switch ON. Reading on VTVM should be less than the reading previously obtained on channel #9 in step #14. Release PWR switch and set C-12B CHANNEL selector on channel #10. Press C-12B PWR switch ON and again note reading on VTVM. Reading again should be less than the reading previously obtained on channel #9 in step #14. Reading should also be within .2 of a volt of that obtained for channel #8.

16. If the adjacent channel VTVM readings are not within .2 of a volt of each other a slight adjustment of trimmer capacitor C-28 will be necessary. For example, let us suppose that the VTVM reading for channel #8 was -1 volt and the reading for channel #10 was -2 volts. Set C-12B CHANNEL selector to channel #10 and press PWR switch ON. Now adjust trimmer capacitor C-28 on receiver OSC-MIXER board until VTVM reads -1.5 volts. Release PWR switch and set C-12B CHANNEL selector on channel #8. Press C-12B PWR switch ON and note VTVM reading. Reading on VTVM should now be very close to -1.5 volts DC. Repeat the above procedure on channels 20, 21 and 22 using channel #21 to set RF level as with channel #9 before.

17. Disconnect attenuator from transceiver ANT. connector and connect signal generator to ANT connector. Set RMO CHANNEL selector to channel #9 and HI-LO switch to LO position. Connect audio voltmeter across transformer T-6 speaker windings. These are the two black wires on the terminal strip mounted adjacent to the transformer.

    Set signal generator output to 1 uv and adjust generator frequency for maximum AVC voltage as indicated on VTVM. Turn generator modulation on and set for 30% modulation. Recovered audio as indicated by the audio voltmeter should be a minimum of 1.75 VAC. Place generator in standby position or tune frequency control off 100KC frequency and noise level should be no greater than .5 VAC. This of course to some extent will depend upon the noise atmosphere of the location. Flourescent lighting and neon signs in the immediate vicinity can raise the rf noise atmosphere considerably and if encountered should be taken into consideration.

    Repeat the tests for channels 1 and 23. The receiver sensitivity should produce 1.75 VAC recovered audio for a 30% modulated 1 uv rf signal.

    When the receiver is properly adjusted the no signal noise level will be from .2 to .3 VAC on channels 1 and 23 and peak up slightly in the middle of the band and recovered audio will vary in the same manner.

18. After alignment has been completed, re-set AUDIO LEVEL control to the panel marking established in step 2 e.

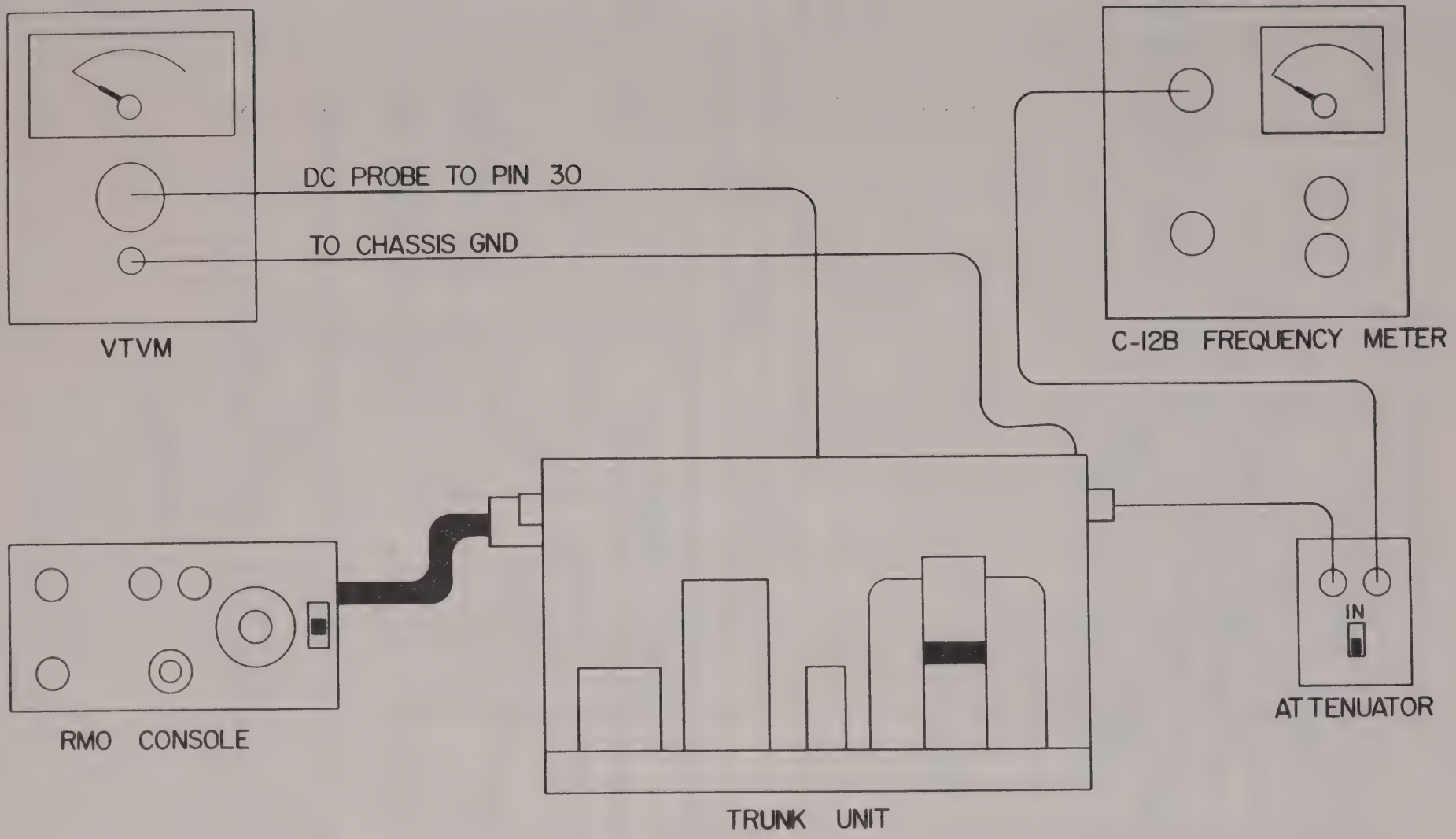

DC PROBE TO PIN 30
TO CHASSIS GND
VTVM
C-12B FREQUENCY METER
IN
ATTENUATOR
RMO CONSOLE
TRUNK UNIT

FIG 3

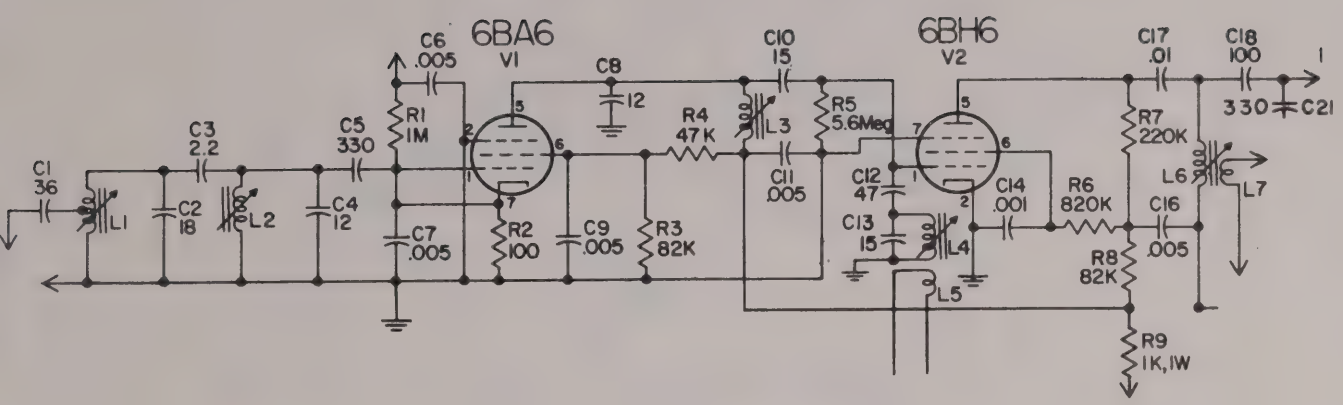
VOLTAGE MEASUREMENT CHART

TUBE TYPE	V NO.	CATHODE			SCREEN			PLATE			CONTROL GRID		
		Pin No.	N/S	W/S									
6BA6	V1	7	+ .8	+ .7	6	+ 64	+ 74						
6BH6	V2				6	+ 38	+38.5						
6CL8A	V3A				7	+11.0	+11.1				9	-1.6	-1.6
6CL8A	V3B							2	90	90	1	-4.3	-4.35
6BA6	V4	7	+2.5	+2.4	6	+ 87	+ 94						
6BA6	V5	7	+3.0	+2.95	6	+107	+115						
6AL5	V6A	1	+.02	+.14									
6AL5	V6B	5	+ .3	+ .5									
12AX7	V7A							6	$+58^{T}$				
12AX7	V7B	3	SQ/off +2.6	SQ/on +34									
6DS4	V8							2	$+55^{T}$				
6AQ5	V9	2	$+15.5^{R}$										
6AQ5	V9	2	$+17.5^{T}$										
6BH6	V10				6	$+215^{T}$					1	-2.8^{T}	
6CL6	V11				3	$+220^{T}$			$+280^{T}$		2	-36.5	
6CL8A	V12A										1	-2.3	
6CL8A	V12B	8	$+11^{R}$	$+46^{T}$	7	+135					9	-13^{R}	0^{T}
6BH6	V13				6	$+215^{R}$	$+240^{T}$				1	$7VAC^{R}$	$7VAC^{T}$

NOTE: All voltages measured with WV-98B VTVM. Transceiver operating from 115VAC.

N/S Measurement made with no signal into receiver

W/S Measurement made with a channel 9 1uv 30% modulated signal fed into receiver ANT terminal


6BA6
V1
6BH6
V2
C1 36
C2 18
C3 2.2
C4 12
C5 330
C6 .005
C7 .005
C8 12
C9 .005
C10 15
C11 .005
C12 47
C13 15
C14 .001
C16 .005
C17 .01
C18 100
330 C21
R1 1M
R2 100
R3 82K
R4 47K
R5 5.6Meg
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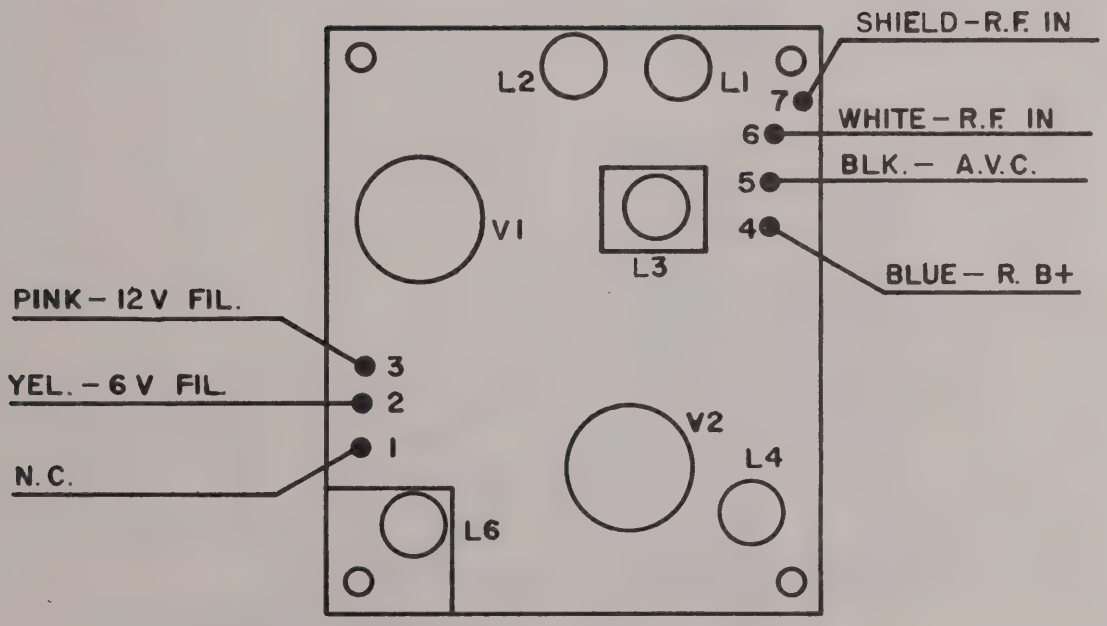
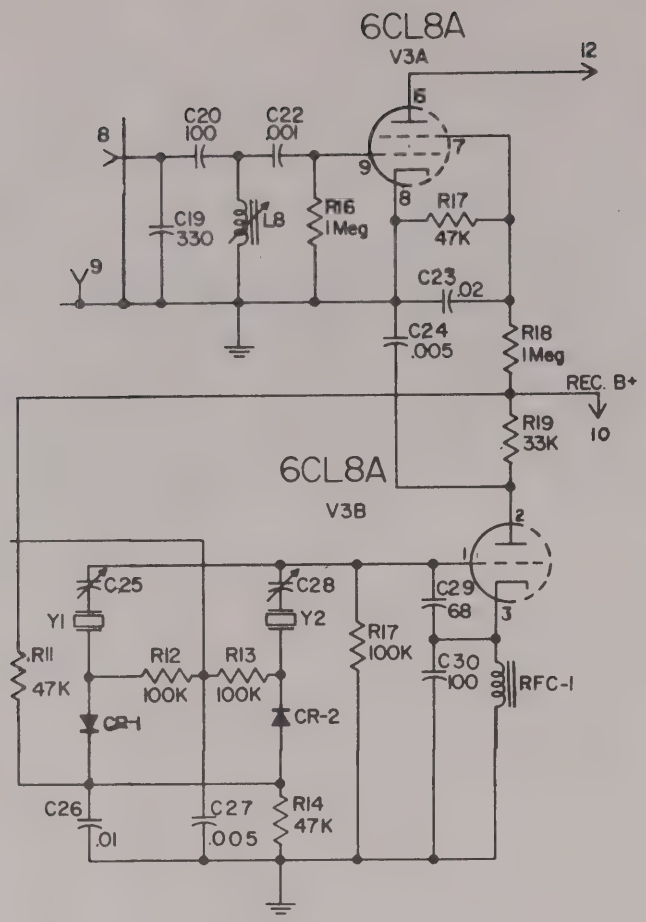
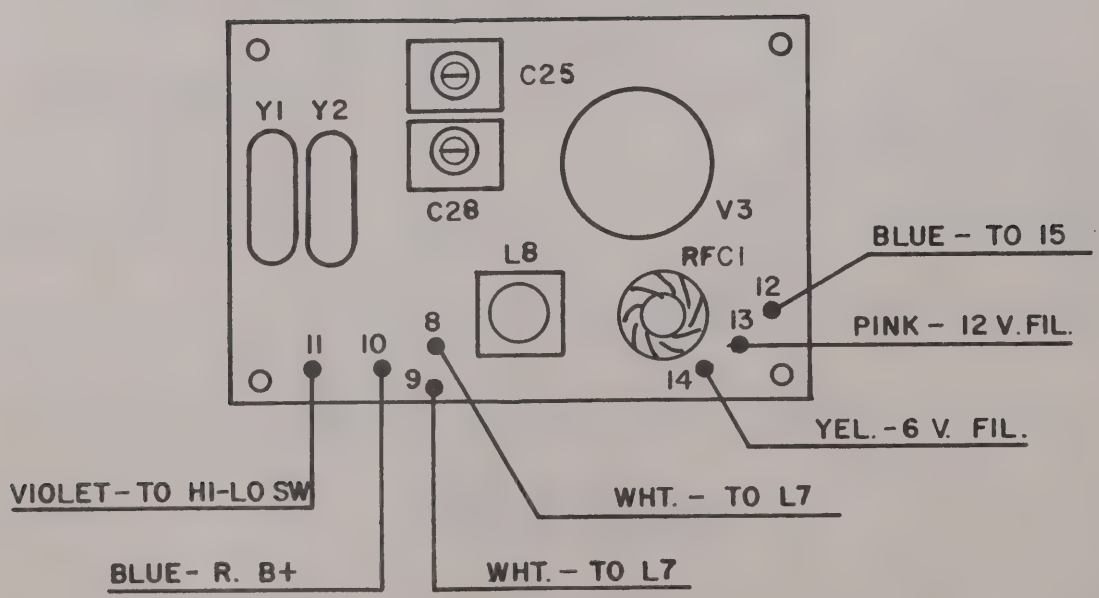
L3
L4
L5
L6
L7

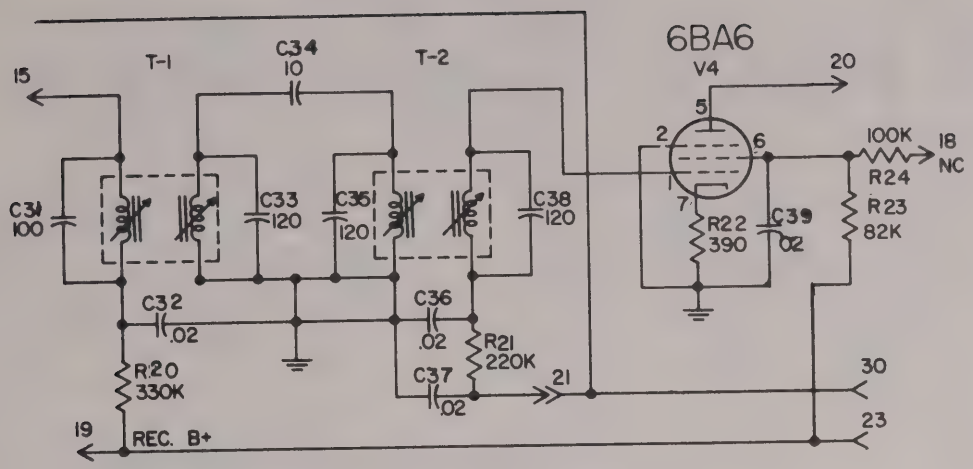

SHIELD – R.F. IN
WHITE – R.F. IN
BLK. – A.V.C.
BLUE – R. B+
PINK – 12 V FIL.
YEL. – 6 V FIL
N.C.
7
6
5
4
3
2
1
L1
L2
L3
L4
L6
V1
V2

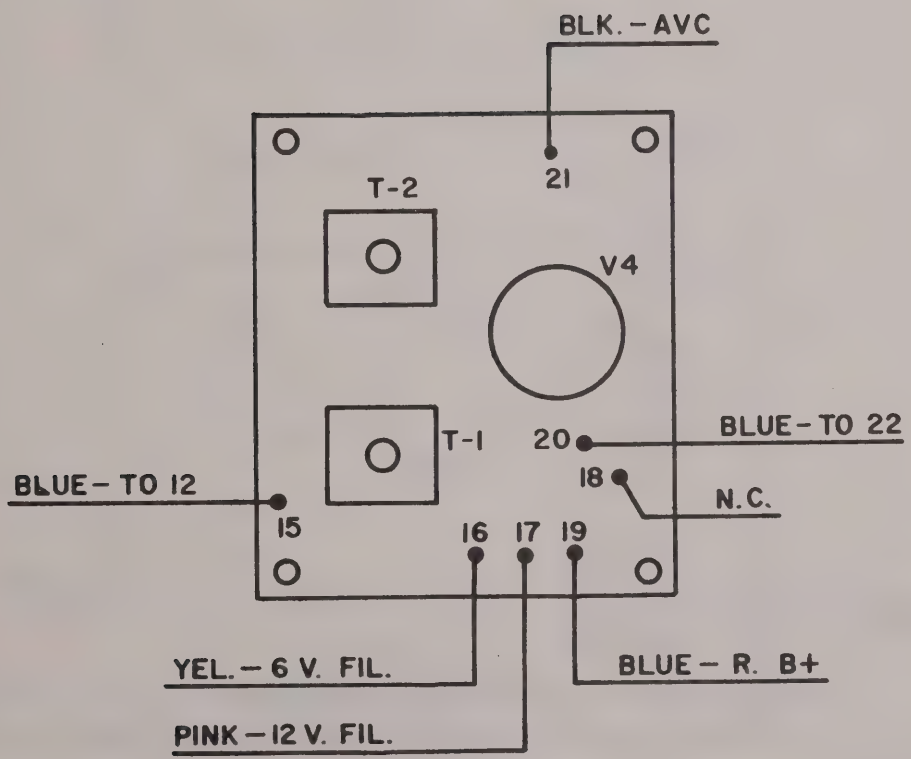
CONVERTER


6CL8A
V3A
12
5
7
9
8
C20
100
C22
.001
8
C19
330
L8
R16
1Meg
R17
47K
9
C23
.02
C24
.005
R18
1Meg
REC. B+
10
R19
33K
6CL8A
V3B
2
1
3
C25
C28
C29
68
Y1
Y2
R17
100K
R11
47K
R12
100K
R13
100K
C30
100
RFC-1
CR-1
CR-2
C26
.01
C27
.005
R14
47K

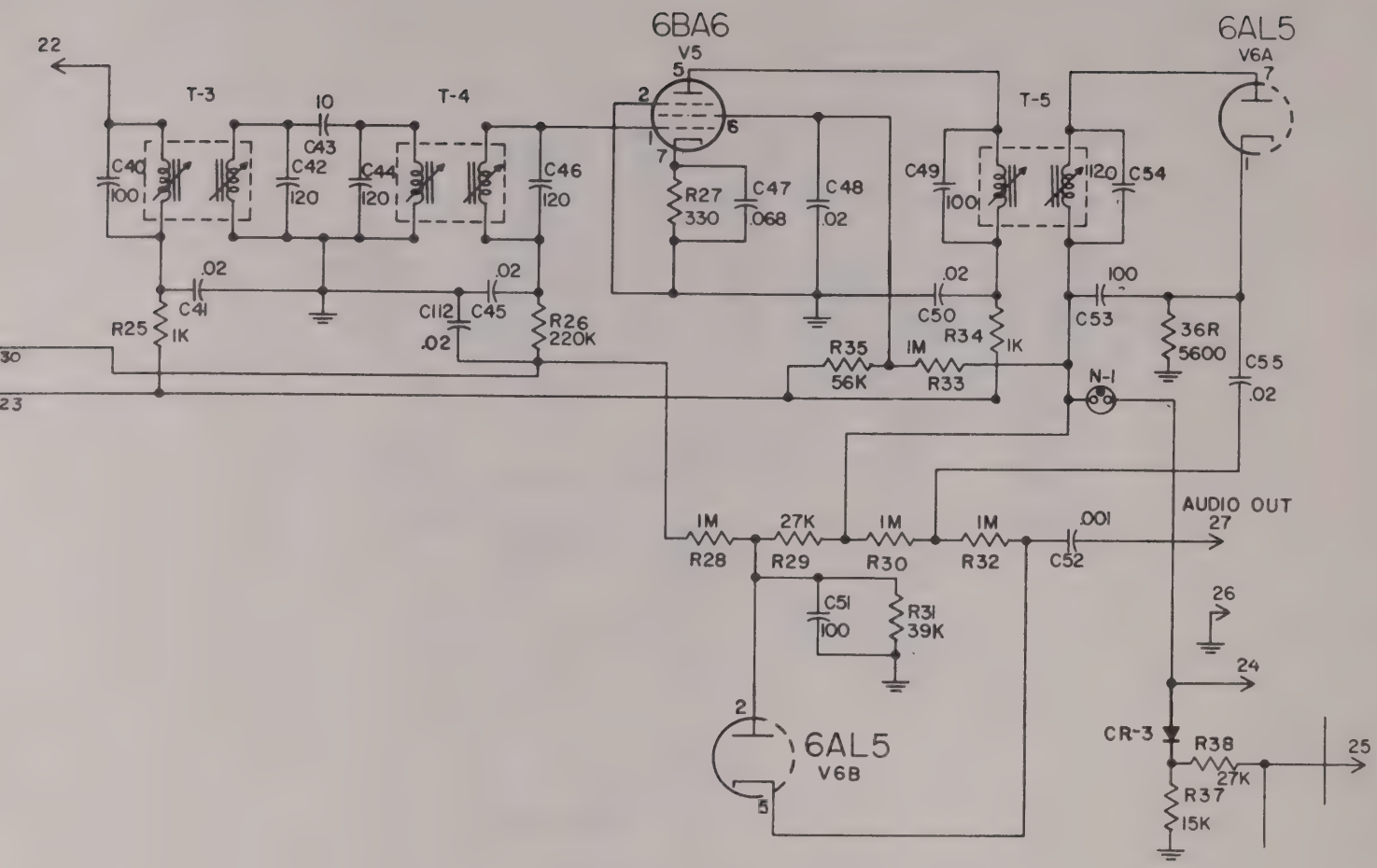

C25
Y1 Y2
C28
V3
L8
RFC1
BLUE - TO 15
12
13
PINK - 12 V. FIL.
11
10
8
9
14
YEL. - 6 V. FIL.
VIOLET - TO HI-LO SW
WHT. - TO L7
BLUE - R. B+
WHT. - TO L7

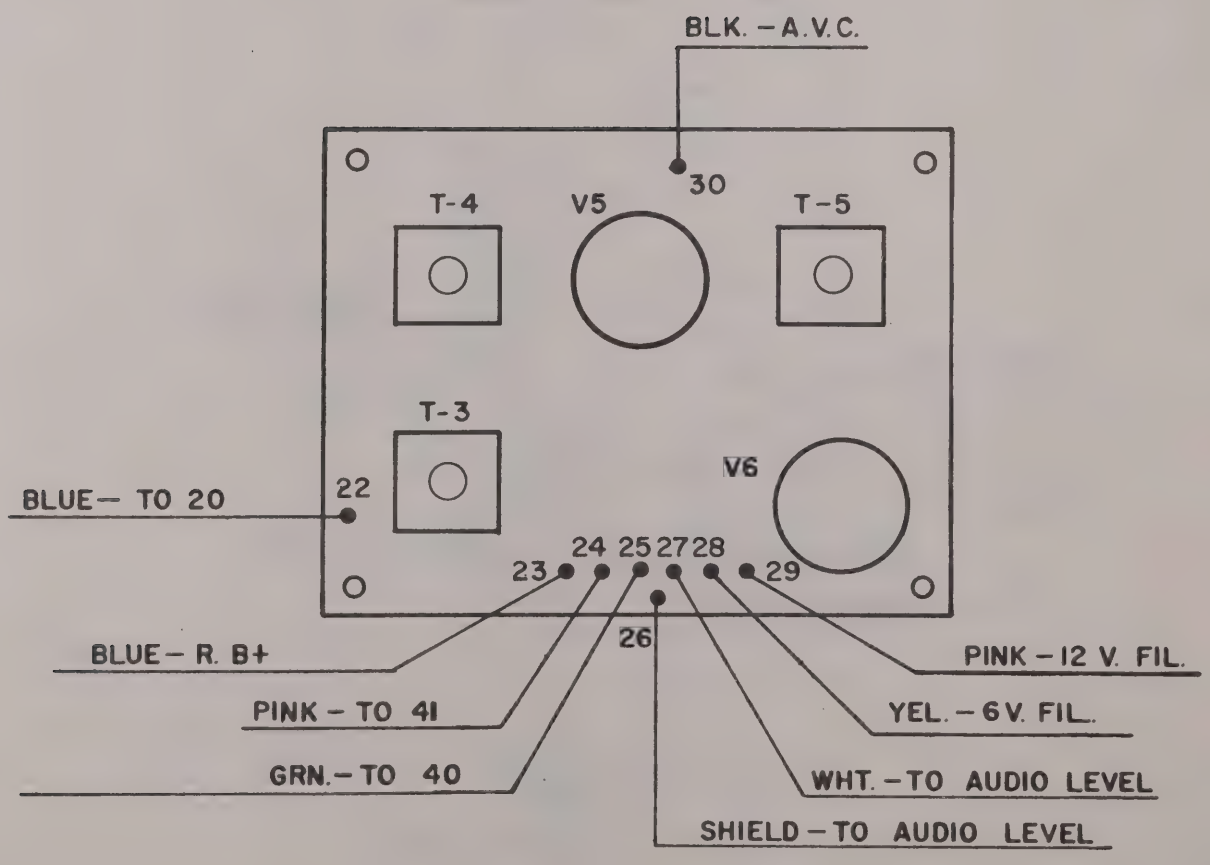
OSC. MIXER


6BA6
V4
T-1
T-2
C34
10
15
20
5
2
6
1
7
100K
R24
18
NC
C31
100
C33
120
C35
120
C38
120
R22
390
C39
.02
R23
82K
C32
.02
C36
.02
R21
220K
C37
.02
R20
330K
21
30
23
19
REC. B+

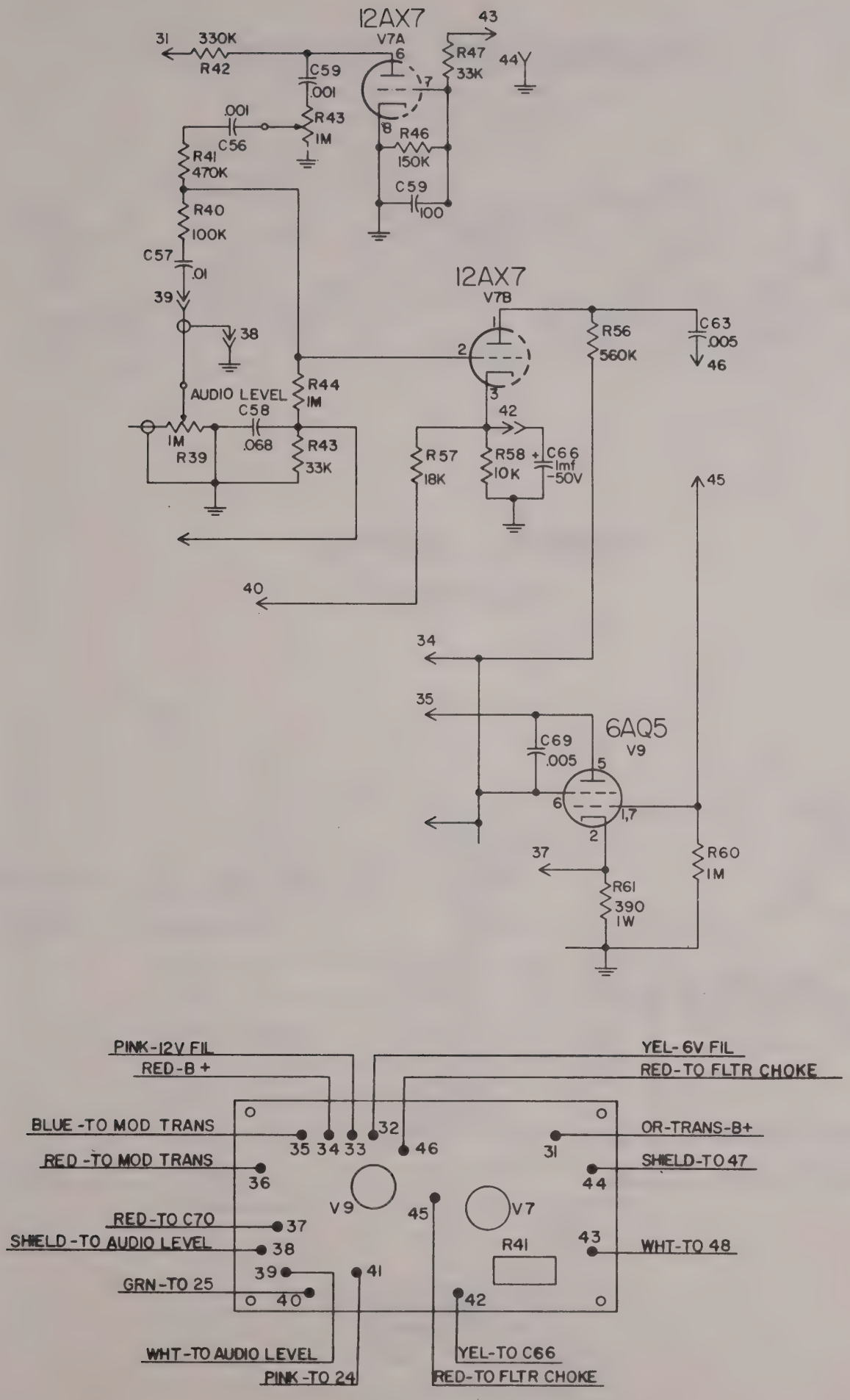

BLK. - AVC
21
T-2
V4
T-1
20
BLUE - TO 22
18
N.C.
BLUE - TO 12
15
16
17
19
YEL. - 6 V. FIL.
BLUE - R. B+
PINK - 12 V. FIL.

IST. I.F. AMP.



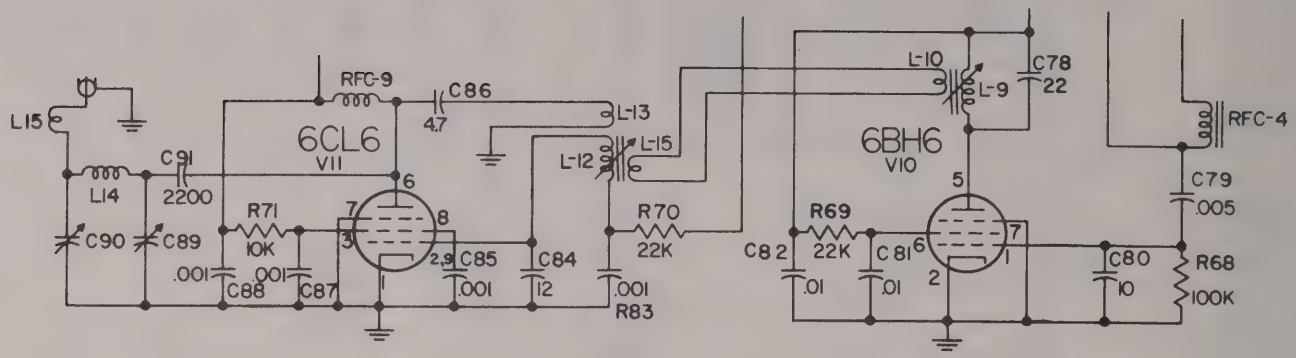


2ND IF DET NOISE LIMITER

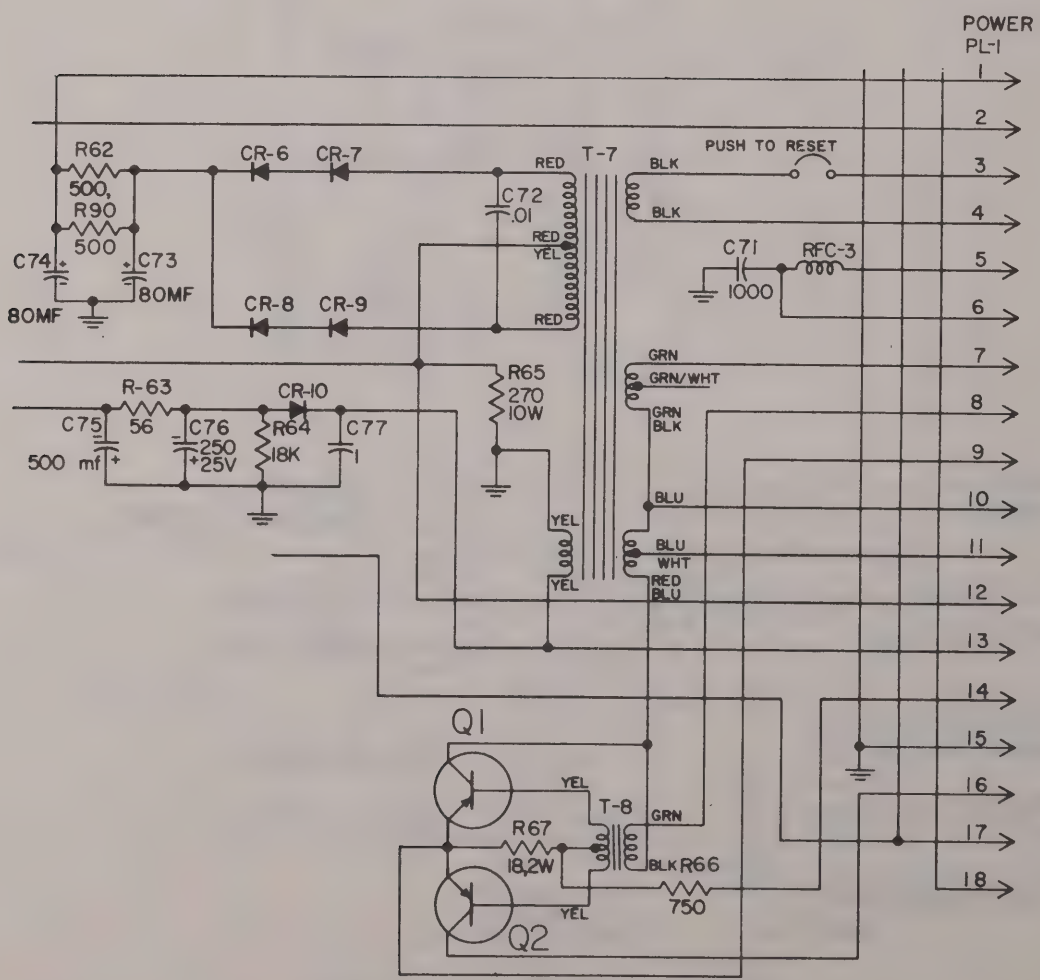

12AX7
V7A
31
330K
R42
C59
.001
.001
C56
R43
1M
R41
470K
R40
100K
C57
.01
39
38
AUDIO LEVEL
C58
.068
1M
R39
R44
1M
R43
33K
43
R47
33K
44
R46
150K
C59
100
12AX7
V7B
R56
560K
C63
.005
46
42
R57
18K
R58
10K
C66
1mf
-50V
45
40
34
35
6AQ5
V9
C69
.005
37
R60
1M
R61
390
1W
PINK-12V FIL
RED-B+
YEL-6V FIL
RED-TO FLTR CHOKE
BLUE-TO MOD TRANS
RED-TO MOD TRANS
RED-TO C70
SHIELD-TO AUDIO LEVEL
GRN-TO 25
WHT-TO AUDIO LEVEL
PINK-TO 24
YEL-TO C66
RED-TO FLTR CHOKE
OR-TRANS-B+
SHIELD-TO 47
WHT-TO 48
V9
V7
R41

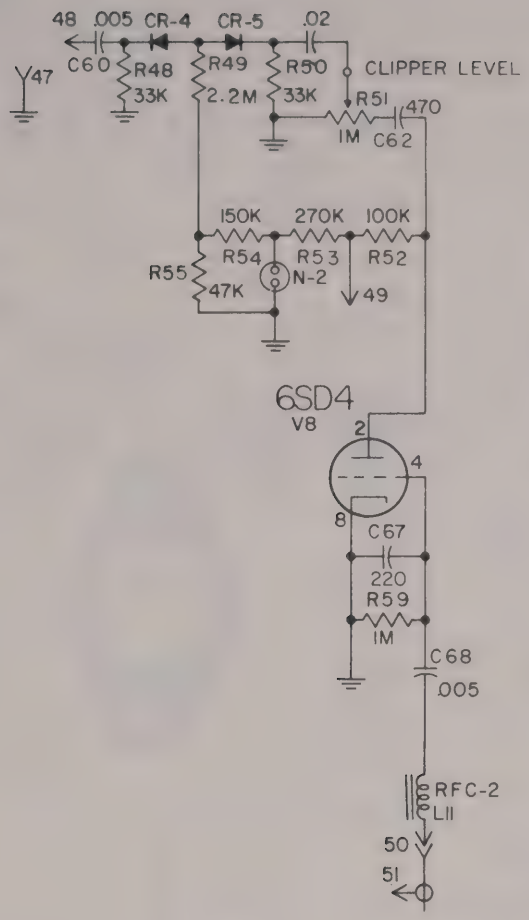
AUDIO UNIT

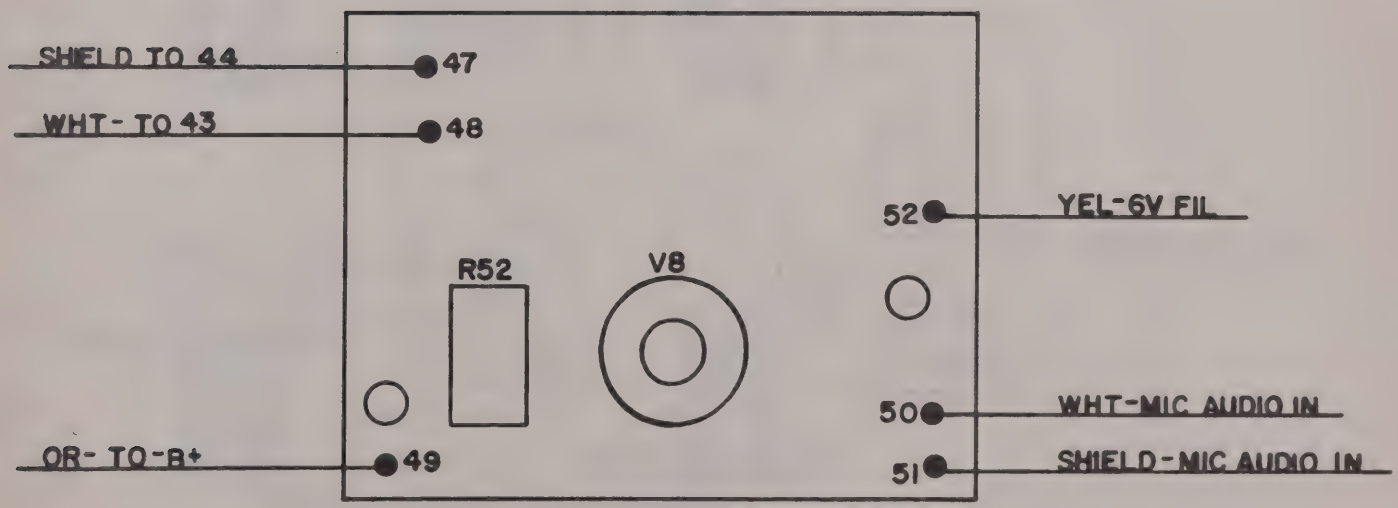
TRANSMITTER SECTION



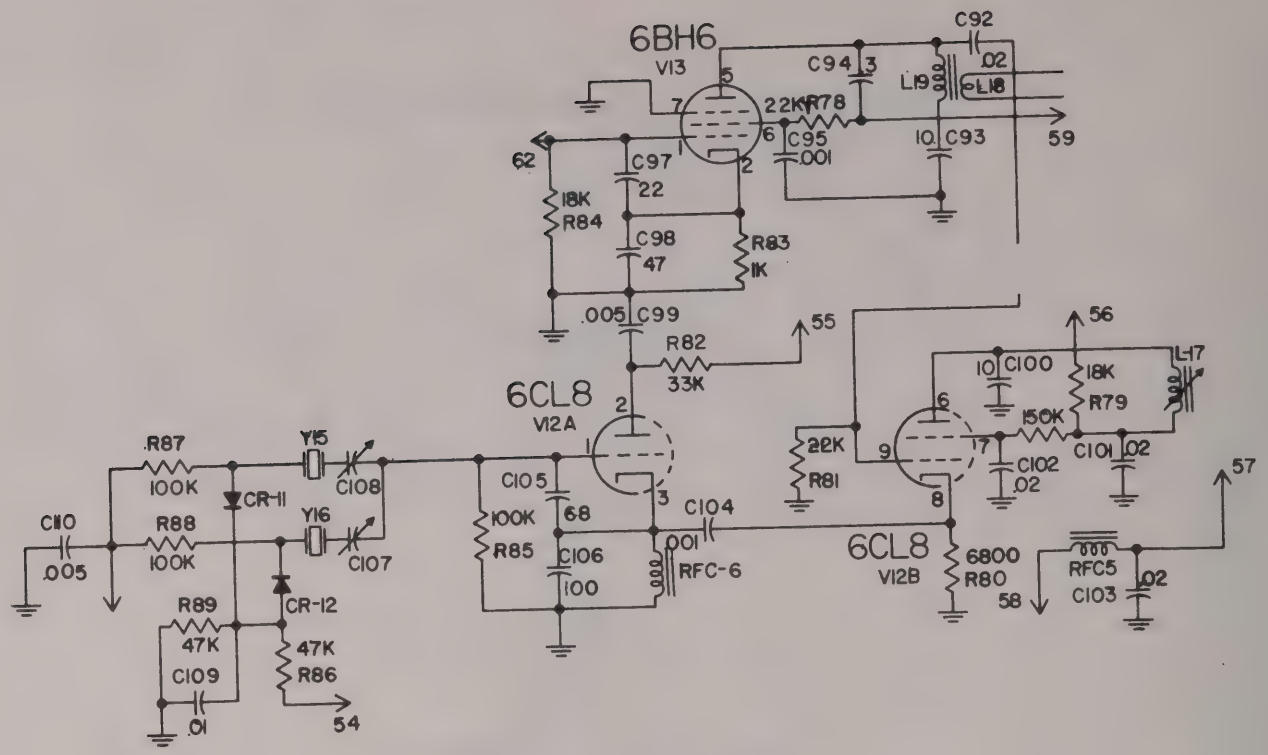
POWER SUPPLY SECTION

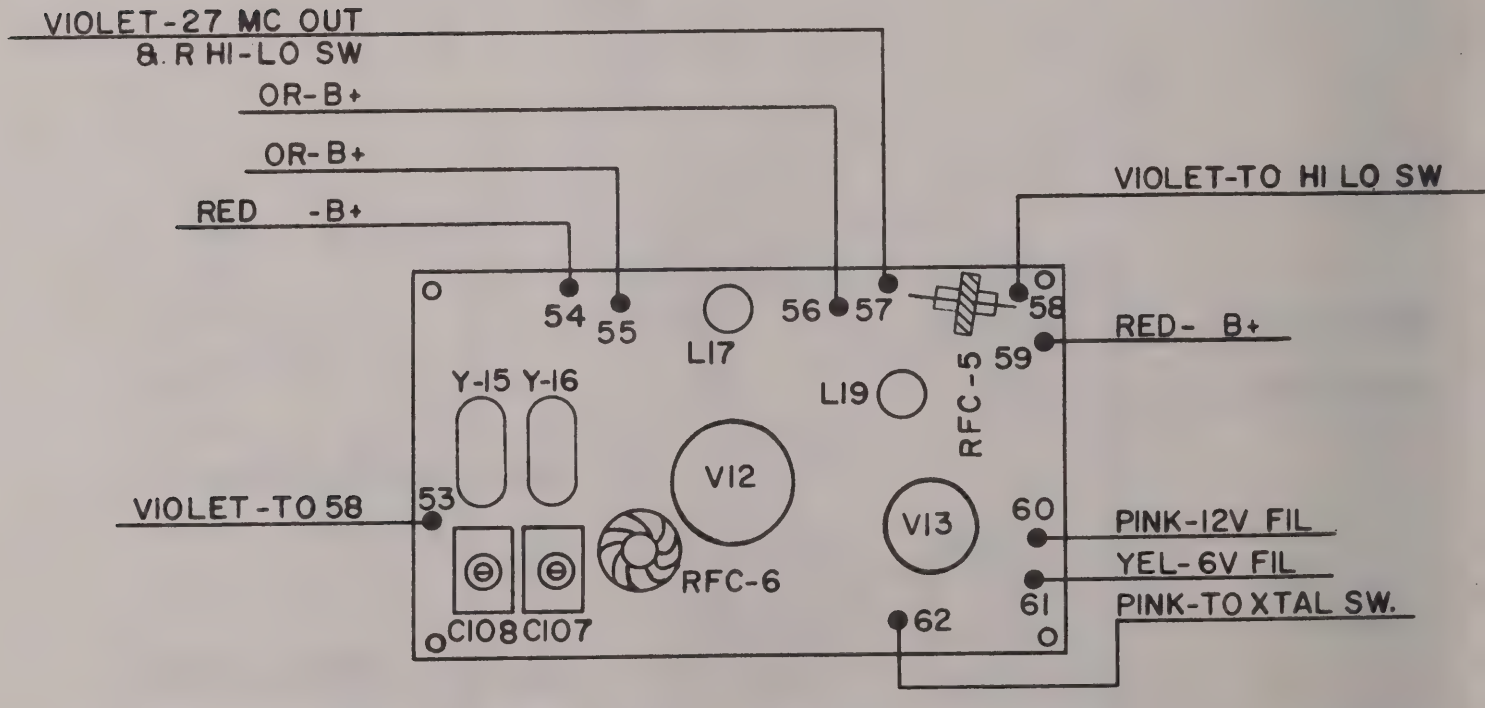




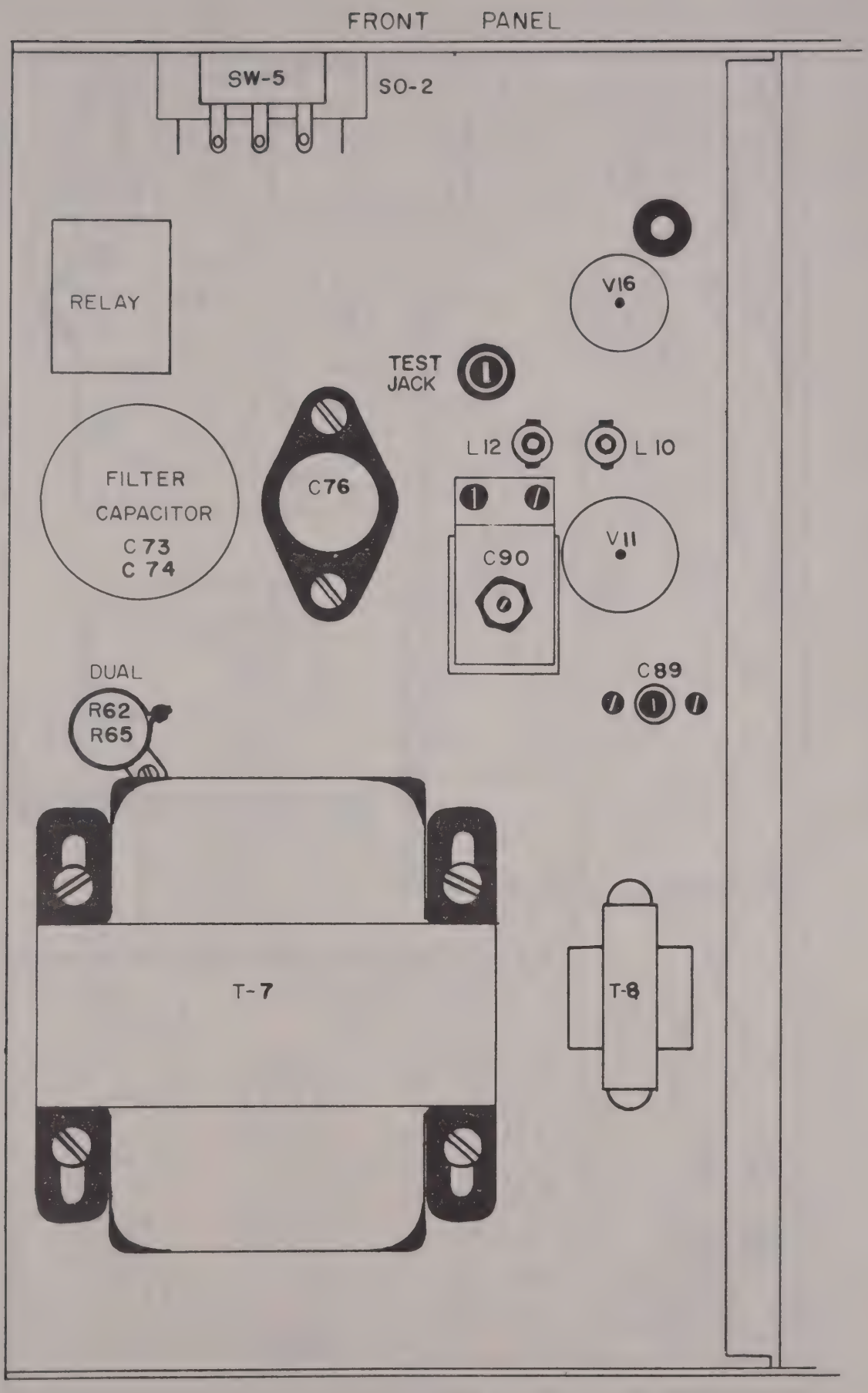


CLIPPER UNIT

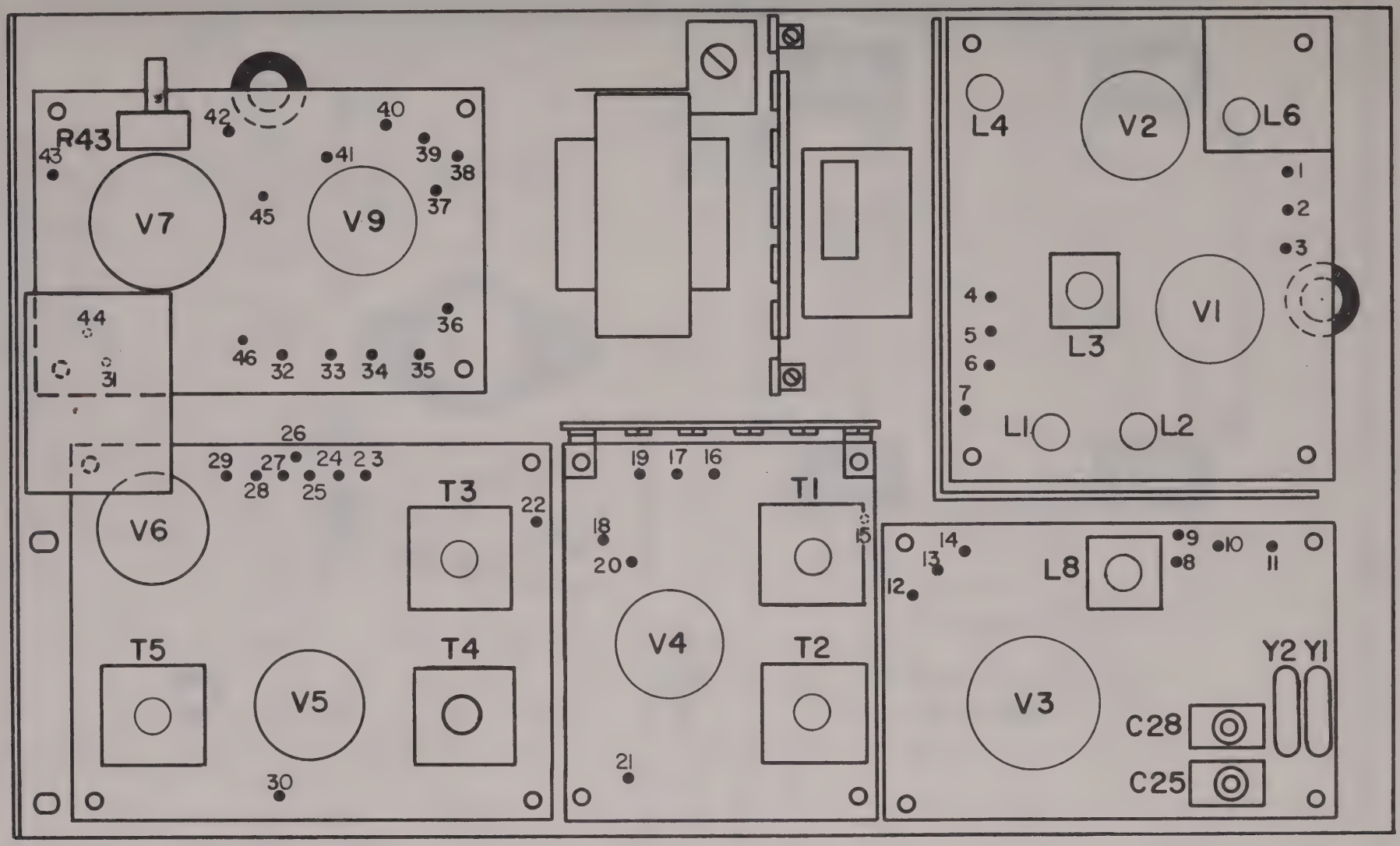

6BH6
V13
C92
.02
C94
3
L19
L18
22K R78
C95
.001
10 C93
59
62
C97
22
18K
R84
C98
47
R83
1K
.005 C99
55
R82
33K
6CL8
V12A
56
10 C100
18K
R79
L17
150K
C101 .02
22K
R81
C102
.02
57
R87
100K
Y15
C108
CR-11
C110
.005
R88
100K
Y16
C107
CR-12
C105
100K
R85
68
C106
100
C104
.001
RFC-6
6CL8
V12B
6800
R80
58
RFC5
C103
.02
R89
47K
C109
.01
47K
R86
54


VIOLET-27 MC OUT
8. R HI-LO SW
OR-B+
OR-B+
RED -B+
VIOLET-TO HI LO SW
54
55
L17
56
57
58
RED- B+
59
RFC-5
L19
Y-15 Y-16
VIOLET-TO 58
53
V12
V13
60
PINK-12V FIL
YEL-6V FIL
RFC-6
61
PINK-TO XTAL SW.
62
C108 C107

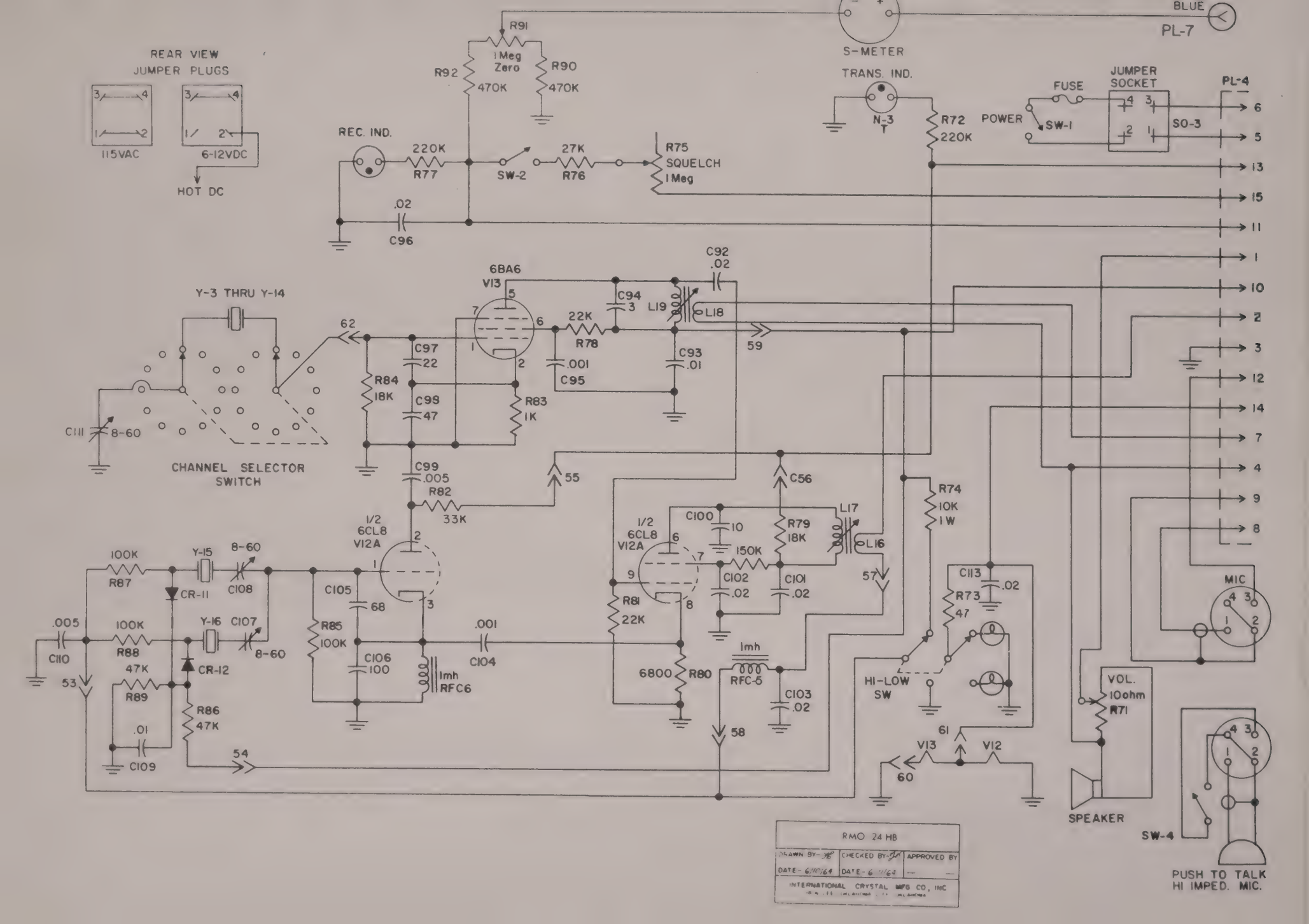
RMO BOARD

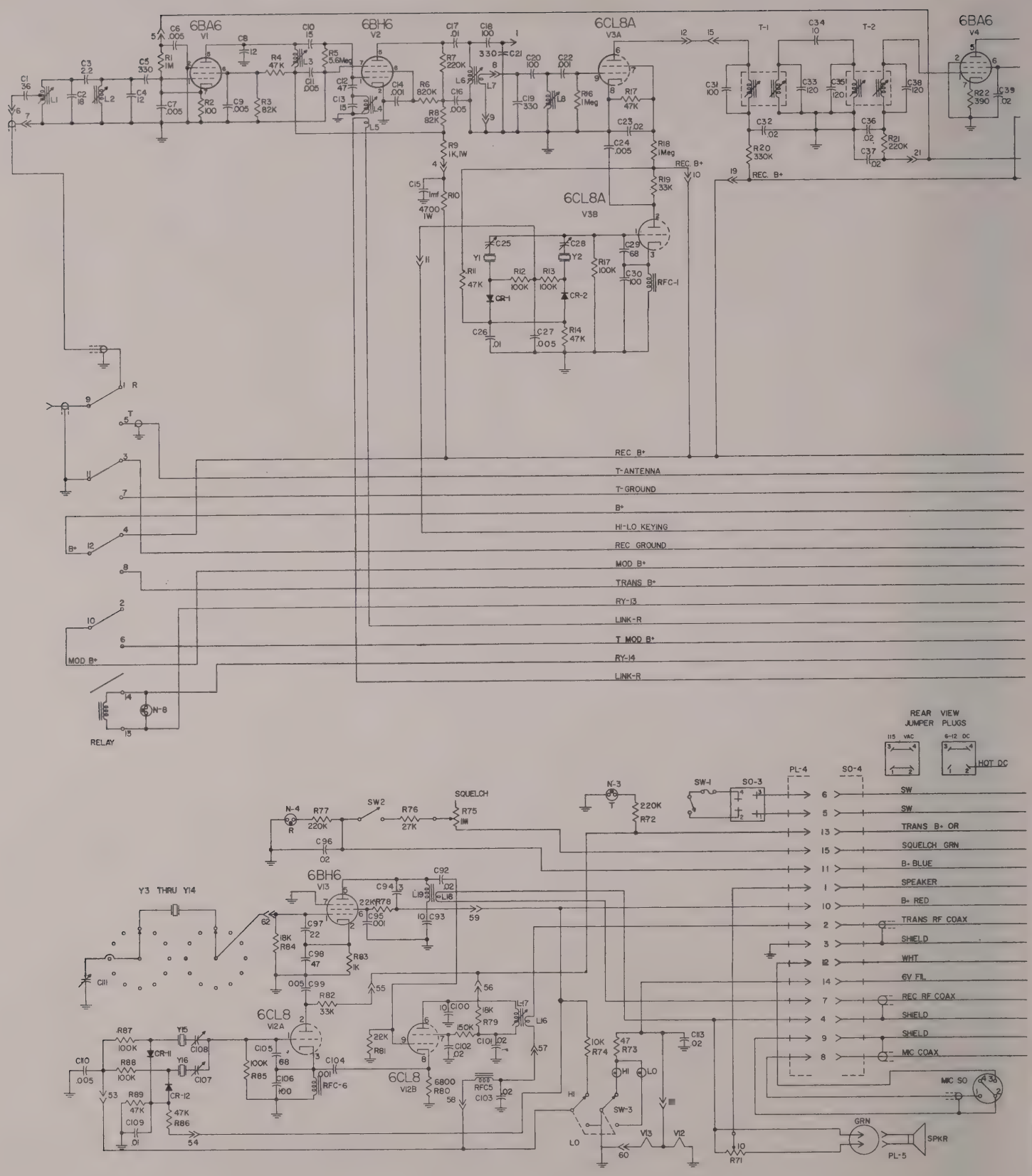

FRONT PANEL
SW-5
SO-2
RELAY
V16
TEST JACK
L12
L10
FILTER CAPACITOR
C73
C74
C76
C90
V11
C89
DUAL
R62
R65
T-7
T-8
TOP VIEW

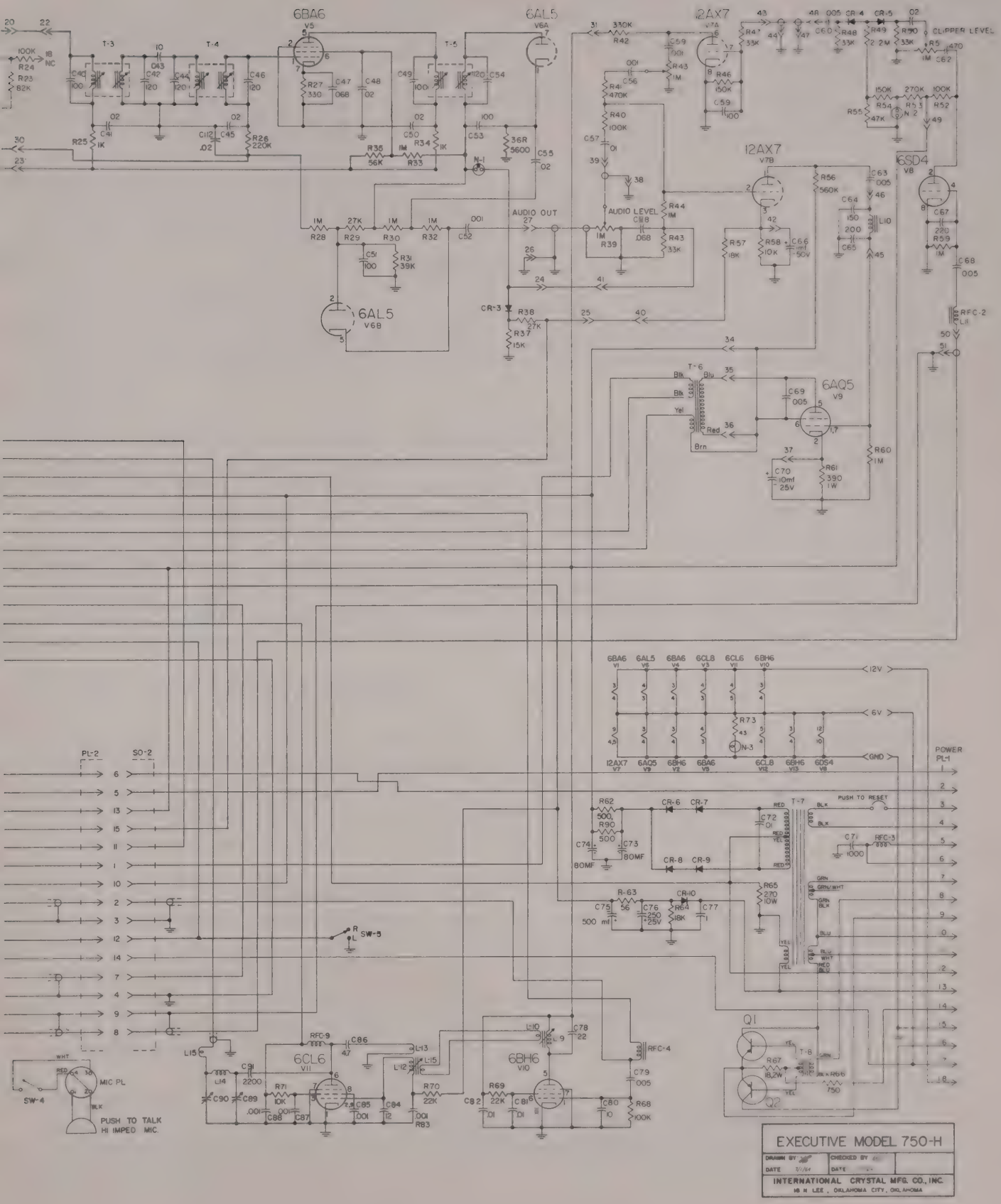
TOP VIEW



RECIEVER SECTION


REAR VIEW
JUMPER PLUGS
115VAC
6-12VDC
HOT DC
R91
1 Meg
Zero
R92
470K
R90
470K
REC. IND.
220K
R77
SW-2
27K
R76
R75
SQUELCH
1 Meg
.02
C96
S-METER
BLUE
PL-7
TRANS. IND.
N-3
T
R72
220K
FUSE
POWER
SW-1
JUMPER
SOCKET
SO-3
PL-4
6
5
13
15
11
1
10
2
3
12
14
7
4
9
8
Y-3 THRU Y-14
C111
8-60
CHANNEL SELECTOR
SWITCH
62
C97
22
R84
18K
C98
47
C99
.005
R82
33K
55
6BA6
V13
C92
.02
C94
3
L19
L18
22K
R78
C95
.001
C93
.01
59
R83
1K
1/2
6CL8
V12A
C100
10
150K
R79
18K
L17
L16
C56
R74
10K
1W
57
R81
22K
6800
R80
C102
.02
C101
.02
C103
.02
58
C113
.02
R73
47
HI-LOW
SW
MIC
VOL.
10ohm
R71
SPEAKER
61
V13
V12
60
100K
R87
Y-15
8-60
C108
CR-11
.005
C110
100K
R88
Y-16
C107
8-60
CR-12
53
47K
R89
R86
47K
.01
C109
54
C105
68
R85
100K
C106
100
1mh
RFC6
.001
C104
1mh
RFC-5
SW-4
PUSH TO TALK
HI IMPED. MIC.
RMO 24 HB
DRAWN BY-
CHECKED BY-
APPROVED BY
DATE- 6/10/64
DATE- 6/11/64
INTERNATIONAL CRYSTAL MFG CO., INC.


6BA6 V1
6BH6 V2
6CL8A V3A
T-1
T-2
6BA6 V4
6CL8A V3B
REC B+
T-ANTENNA
T-GROUND
B+
HI-LO KEYING
REC GROUND
MOD B+
TRANS B+
RY-13
LINK-R
T MOD B+
RY-14
LINK-R
RELAY
N-8
MOD B+
REAR VIEW
JUMPER PLUGS
115 VAC
6-12 DC
HOT DC
PL-4
SO-4
SO-3
SW-1
N-3
SW2
SQUELCH
N-4
6BH6 V13
6CL8 V12A
6CL8 V12B
Y3 THRU Y14
SW-3
HI
LO
SW
TRANS B+ OR
SQUELCH GRN
B+ BLUE
SPEAKER
B+ RED
TRANS RF COAX
SHIELD
WHT
6V FIL
REC RF COAX
SHIELD
SHIELD
MIC COAX
MIC SO
GRN
SPKR
PL-5


6BA6
6AL5
12AX7
12AX7
6SD4
6AL5
6AQ5
6CL6
6BH6
T-3
T-4
T-5
T-6
T-7
T-8
CLIPPER LEVEL
AUDIO LEVEL
AUDIO OUT
PUSH TO RESET
PUSH TO TALK
HI IMPED MIC.
MIC PL
SW-4
SW-5
POWER
PL-1
PL-2
SO-2
12V
6V
GND
EXECUTIVE MODEL 750-H
INTERNATIONAL CRYSTAL MFG. CO., INC.
18 N LEE, OKLAHOMA CITY, OKLAHOMA

WARRANTY REGISTRATION

Model_____ Date Purchased_____ Serial No._____

Purchased from_____

Owner's Name_____

Owner's Address_____

City_____ State_____

Owner's Call_____

10-153

WARRANTY

International Crystal Manufacturing Company warrants the parts and tubes in any International Citizen Transceiver to be free from defects in workmanship and material arising from normal usage. Its obligation under this warranty is limited to replacing any such parts or tubes of the receiver which, after regular installation and under normal usage and service, shall be returned within ninety (90) days from the date of original purchase of the set to the authorized dealer from whom the purchase was made and which shall be found to have been thus defective in accordance with the policies established by International Crystal Manufacturing Company.

The obligation of International Crystal Manufacturing Company is limited to making replacement parts available to the purchaser, and does not include either the making or the furnishing of any labor in connection with the installation of such replacement parts nor does it include responsibility for any transportation expense.

International Crystal Manufacturing Company assumes no liability and shall not be liable in any respect for failure to perform or delay in performing its obligations with respect to the above warranty if such failure or delay results, directly or indirectly, from any preference, priority or allocation order issued by the Government or because of any other act of the Government, or by war, conditions of war, inadequate transportation facilities, conditions of weather, acts of God, strikes, lockouts, Governmental controls, or Internationals reasonable requirements for manufacturing purposes, or any cause beyond its control or occurring without its fault, whether the same kind or not.

CONDITIONS AND EXCLUSIONS

This warranty is expressly in lieu of all other agreements and warranties expressed or implied, and International Crystal does not authorize any person to assume for it the obligations contained in this warranty and neither assumes nor authorized any representative or other person to assume for it any other liability in connection with such International units or parts or tubes thereof.

The warranty herein extends only to the original consumer purchaser and is not assignable or transferable and shall not apply to any transceiver or parts or tubes thereof which have been repaired or replaced by anyone else other than an authorized International dealer, service contractor or distributor, or which have been subject to alteration, misuse, negligence or accident, or to the parts or tubes of any receiver which have had the serial number or name altered, defaced or removed.

International Crystal Manufacturing Company is under no obligation to extend this warranty to any unit for which an International registration card has not been completed and mailed to the Company within fifteen (15) days after date of purchase.

FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D.C.

87048
April 15, 1960

UNAUTHORIZED PRACTICES IN BUSINESS AND CITIZENS RADIO SERVICES

An increasing number of reports have reached the Commission concerning the practice of some suppliers of Business and Citizens Radio Services equipment to advise their customers that such equipment may be operated by them prior to the issuance of a radio station license by the Commission. In some instances, sellers have "assigned" radio station call signs to purchasers in conjunction with the sale of radio apparatus and, in a few such cases, these call signs have been identical with those authorized to be used by the manufacturer or seller of the equipment.

A radio station license is required for the use or operation of a radio station in the Business and Citizens Radio Services by Section 301 of the Communications Act. With the exception of certain low power equipment described in Part 15 of the Commission's Rules, the operation of any radio transmission apparatus by a person other than the one to whom the Commission has issued a radio station license is illegal and may result in the imposition of severe criminal sanctions (one year in prison or $10,000 fine, or both) or in the institution of other enforcement action by the Commission.

Under Section 310 (b) of the Communications Act, the prior consent of the Commission is required for the transfer or assignment of any radio station license or the rights granted thereunder. One who fails to observe this provision by the purported transfer of his operating authority subjects himself to possible license revocation and such other enforcement action as the Commission may consider warranted by the circumstances. The denomination of such unlawful activities as "equipment demonstrations" does not render them less illicit.

This matter is being brought to the attention of manufacturers, distributors and retail vendors of Business and Citizens Radio Service communication equipment in the belief that they share the Commission's conviction that the orderly development of these dynamic special radio services is hampered by the above-described practices and that one who engages in such practices, in addition to the possibility of having drastic enforcement action instituted against him, may be sacrificing for the benefit of an immediate sale the long range good will of a misadvised customer.

It is requested that the foregoing be brought to the attention of the personnel in all organizations concerned in any way with the sale, maintenance or use of Business or Citizens Radio Stations in order that a prompt cessation of unlicensed operation of radio stations in these services may be brought about.

-FCC-

F.C.C. RULES & REGULATIONS

PART 95.72 POSTING OF STATION LICENSE

(b) The current authorization of each citizens radio station operated as a mobile station or operated at temporary locations may be retained in the permanent records of the station and need not be posted; However, an executed Transmitter Identification Card (FCC Form 452-C, Revised) shall be affixed to each transmitter which is operated as a mobile station or is operated at temporary locations, and to the control equipment of each such transmitter in every case where such transmitter is not in view from the location from which the station is controlled.

(c) The following information shall be entered on each Transmitter Identification Card (FCC Form 452-C, Revised) which is used for transmitter or station identification in accordance with the foregoing:

(1) Name of the station licensee;
(2) Station call sign assigned by the Commission (see 95.62);
(3) Exact location or locations of the permanent station records;
(4) Frequency or frequencies upon which the associated transmitter is adjusted to operate; and
(5) Signature of the licensee.